The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XV. No. 369 JULY 24, 1926 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0.

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The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.*

The Editorial and General Offices are now—Bouverie House, 154, Fleet Street, London, E.C.4.

Telegrams: "Allangas, Fleet, London." Telephone: City 0244.

The London Congress

WRITING when the London Congress of Chemists is about half way through, one has no hesitation in speaking of it as a complete success. Judged by its impact upon public opinion and the attention it has received in the daily Press, it surpasses, we believe, all previous conferences. That is far from being an unimportant side. If the public is to understand and appreciate chemistry it must hear something it can understand about it. It has heard this week a great deal of what chemistry is doing for the nation and for national industry, and presently, it is to be hoped, the result may be seen in a fuller employment of chemists, with an improved status, in all the industries in which science plays a part.

But even more essential is it to keep the inner spirit of chemical science alive. The London Congress ought certainly not to be fruitless in this respect, for the papers and discussions have been of the most stimulating character. In this respect one cannot help noticing how much of the initiative comes from the engineering end. The plant manufacturers have at last done justice to themselves and to their products. Their exhibition really gives some adequate idea of the quality and range of their output, and of the sound work that lies behind the actual construction in the manufacture of constructural materials and in the mastery of design and engineering. Very closely linked with the exhibition was the symposium on corrosion, in which the subject was not only surveyed historically, in regard to fundamental principles, but some points of acute practical interest for all chemical works were frankly opened up, particularly in the papers by Mr. Parrish. On the more purely chemical side, though this implies efficient engineering as well, there were exhaustive discussions bearing on the "Hormones," power alcohol, the chemistry of paints and varnishes, fat extraction, and so forth. It was much too comprehensive to be all taken in at once, but substantial good may be expected from the quickening of ideas and interest at the moment, and from the more leisured study of the views expressed when they become available in print.

The Chemical Lead Controversy

IT has been known for some time that a sub-committee was considering the question of a suitable specification for chemical sheet lead, and that a draft specification had been circulated privately to sulphuric acid and chemical lead manufacturers. Some casual criticism had been heard on the ground that the details of the tests recommended were not sufficiently precise. But no pointed objection had been made to the proposed specification, the compilation of which is clearly not an easy matter, until Mr. P. Parrish, in his paper at the corrosion symposium on Tuesday, frankly opened up several pertinent questions, which were favourably commented upon at the time and have been the subject of considerable discussion since.

The point Mr. Parrish emphasises is the importance of purity where chemical sheet lead is to be used for sulphuric acid chambers and ammonium sulphate saturators. He prefers the Pattisonian refined lead to that produced by the Parkes process, and gives details of tests to support his view. He believes that too much importance is attached to the decomposition temperature of chemical sheet lead, which can be favourably influenced by the introduction of small quantities of copper. A flash test may be important where lead is to be employed for sulphuric acid concentration pans, or for the saucer of a Glover tower, but it is less significant for many other requirements. A very relevant question was asked: "What bearing has the incipient attack on chemical sheet lead by sulphuric acid at temperatures over 200° C., when the chemical sheet lead has to be used for purposes where the temperature rarely, if ever, exceeds 110° C.?"

It is urged that more attention should be given to purity and methods of preparing the sheets, and less to the flash test. Mr. Parrish indicates a series of factors calculated to have an important bearing on the resistivity of chemical sheet lead to corrosion. The temperature reached in the melting pot, the method of removing the impurities, the pressure and

temperature at which the sheets are rolled, are, in Mr. Parrish's view, matters of vital importance which are insufficiently considered at the moment. Dr. Rosenhain apparently agreed with this view. Mr. Parrish deprecated the use of too many acceleration tests, and pointed out that many samples of chemical sheet lead which he had examined under practical conditions initially become coated with lead sulphate, which exerts an important protective influence, and gives an immunity from attack that continues for several weeks. Such a phenomenon could not possibly be revealed either by nitrosyl-sulphuric acid or *aqua regia* tests. Hence, inaccurate conclusions are likely to be reached as a result of the acceleration tests which have been recommended.

Whether the introduction of small quantities of copper to chemical sheet lead is calculated to improve the mechanical properties is open to question. Copper and antimony both increase the hardness of lead, and this is an undesirable property, from the point of view of sulphuric acid chambers. The side and many other sheets of a chamber stretch, either as a result of continued hanging or by reason of an increase of temperature, and it is known that leakages develop at the point where the lead has greater hardness than that normally possessed by the sheet itself. It is difficult to ensure a homogeneous incorporation of copper. Thus local hardness results, and fractures ensue. It cannot be doubted that Mr. Parrish has directed attention to several very important points, which certainly should receive careful consideration before a final specification relating to chemical sheet lead is issued. No more stimulating paper has been heard during the congress.

Centrifugal Basket Corrosion

THAT the corrosion of centrifugal baskets as used in the manufacture of by-product ammonium sulphate has been the source of much concern to chemical manufacturers, gas engineers and coke oven managers during the last few years, is generally known. It is remarked by Mr. J. W. Young, Alkali Inspector for Scotland, in his recent report, "Iron, steel and aluminium have been tried in place of copper, and they endured somewhat better than was expected; possibly experiments with alloys may indicate the choice of a metal, comparatively inert to corrosion by acid and ammonia, and hard enough to withstand the shocks of manufacture and attrition by the crystals." The contribution on this subject by Mr. P. Parrish to the Congress of Chemists on Tuesday is peculiarly timely. He compares the technique of the manufacture of by-product ammonium sulphate 10 years ago with that of the present time, and points out clearly why the conditions are so much more exacting to-day.

From the homogeneity chart, which furnishes data illustrating the acidities and alkalinities at varying parts of the salt bed at different stages of the process, information is afforded that can hardly have been common knowledge hitherto. It is clear that not only have alternating acid and alkaline conditions to be encountered, but in the final stage of the centrifuging process, there may be localised layers of acid salt in contact with a greater quantity of alkaline salt in the centrifugal basket. These conditions are severe in themselves, but the chief disturbing factor is the application of the weak ammonia solution, which attacks copper or copper-containing alloys, with the formation of ammonium-cupric sulphate. Repairs and maintenance of centrifugal baskets, spindles and gauzes 10 years ago cost at certain large works 5d. per ton of sulphate produced. Following the introduction of neutralising processes this figure reached 1s. 3d. per ton. As the result of continued research, and improvements introduced, with the use of phosphor bronze baskets, spindles and steel gauzes, to-day's cost is 7·4d. per ton.

It is evident, however, from the paper that this cost can be still further reduced. Mr. Parrish has apparently reached the conclusion that rolled or forged Monel metal possesses properties that render it peculiarly suitable for use under the conditions described. Indeed, a practical trial with a Monel metal basket reveals that the loss of weight per thousand tons of throughput is only 2½ per cent., as contrasted with a loss of 18 per cent. per thousand tons of throughput with a phosphor bronze basket. It is predicted that a throughput of at least 10,000 tons can be obtained with a Monel metal basket as compared with 2,250 tons with a phosphor bronze one. These figures are, to say the least, highly suggestive.

It is impossible to review all the interesting points raised in the paper. Mention, however, must be made of the caution the author offers concerning Monel metal castings. These, he suggests, should be avoided as far as possible, and wherever circumstances permit, rolled plate pressed to suitable shapes should be used. This procedure is necessary, because Monel metal castings may lack homogeneity, and become susceptible to ready attack. The photomicrographs shown certainly seemed to support this contention. Dr. Rosenhain, in the discussion, suggested that what Mr. Parrish proposed in this connection was little short of a counsel of perfection, and that probably price considerations would militate against the practicability of his proposals. He agreed that casting conditions were insufficiently considered, and indicated means by which maximum density in castings could be ensured. Dr. Rosenhain suggested degasifying the castings.

We commend to our readers the valuable suggestions made by Mr. Parrish for ensuring a longer lease of life of centrifugal baskets. There can be no doubt that the percentage loss of metal can be appreciably reduced with the employment of heavier shell plates. Moreover, the final suggestion should not lightly be disregarded. Mr. Parrish emphasised the need for concerted action, and suggested that a centrifugal of standard size, with a standard spindle and a standard valve, should be adopted. In this way it would be possible to dispense with a multiplicity of blocks or presses, and mass production, with its usual economies would become possible. Probably price considerations would not preclude the use of Monel metal pressed plates of various shapes under these circumstances. Collaboration in this matter between chemical plant manufacturers and by-product ammonium sulphate producers cannot but be of mutual advantage.

Synthetic Halogen Hydracids

WE have had occasion several times in the past to refer to what is undoubtedly one of the most significant phases of industrial chemical development, *viz.*, the continuous attempts to produce by synthetic processes those materials for which we have had to depend on nature. Such products have been derived either direct or by more or less simple processes. One by one we have seen these products produced synthetically, and the world's needs met by the factory instead of by the forest, the mine, or the plantation. The research which must necessarily precede such industrial developments has become more and more intensive during the last few years. Where such investigations have pointed the way, the subsequent difficulties attendant on the transfer to large scale operations have, in many cases, proved almost insuperable, added to which the final competition with the natural product had still to be faced. In most cases, however, a complete technical, if not commercial, success has been attained. We have already witnessed the successful production of ammonia and nitric acid, and, more recently, methyl alcohol and acetic acid, while the Bergius, Fischer, and similar processes bid fair to supply us, if not with the identical natural fuel and solvent alcohols and hydrocarbons, with very near substitutes for them. We should not care to speculate on the amount or extent of the research work which is going on at the present time with the definite object of ousting from the market more and more of those essential products for which we have to depend directly, or almost directly, on natural sources, and to replace them by those made in the factory, where the production can be brought under better control.

The synthetic production of hydrochloric and hydrobromic acids does not, perhaps, fall strictly into line with those other products we have mentioned, inasmuch as the same original raw materials, *viz.*, the naturally occurring haloid salt deposits, form the starting-point both for the production of the free halogens and for the halogen acids. Nevertheless, the recent work of Prof. Bernhard Neumann and his co-workers at Breslau is of considerable significance. The idea of producing hydrogen chloride and bromide direct from the halogen is not a new one. Years ago, Lorenz, Naumann, Nagel and others showed that hydrogen chloride could be obtained from chlorine and water vapour, by passing them over heated carbon. The process has more recently been the subject of several patents which have been taken out in this country, Germany, and America. The Bayer firm introduced a process in which water-gas was used. Nothing further appears to have been done until quite recently, when Neumann took up the question again. His investigations, for which patent protection has been sought, have aroused considerable interest. He has demonstrated that practically quantitative yields of hydrogen chloride are produced by passing a stream of chlorine and water vapour over wood charcoal at 600° C. By using coke instead of charcoal, the synthesis is achieved at 450°, and with activated charcoal, at 350°. A mixture of wood charcoal and iron oxide gives the same results at 350°. When coke is employed, there is a tendency for the resulting acid to contain traces of sulphur compounds, but if charcoal is used the hydrochloric acid is chemically pure.

For many purposes, this product would possess advantages over the present commercial product which may contain iron chloride, sulphur oxides, and other impurities. Concentrated fuming acid is obtained direct by condensation of the gases. Hydrobromic acid has been obtained in a similar way from bromine vapour and steam. Using charcoal and iron oxide at 500–550°, a 60 per cent. fuming hydrobromic acid, free from bromine, is obtained. Although a certain amount of hydrogen chloride has, in fact, been made synthetically, the day is probably a long way off which will witness the successful production of hydrochloric and hydrobromic acids on an established commercial scale. The former is being produced in large quantities from salt by direct decomposition, and as a by-product in chlorination operations—a source which is probably on the increase. But a mass production of chlorine by the electrolytic process might conceivably alter the situation. Hydrobromic acid is, of course, relatively unimportant, but its manufacture by Neumann's process is a question which comes much nearer to immediate consideration.

The B.D.C. Meeting

THE principal points in the annual meeting of the British Dyestuffs Corporation have already been briefly noted, and there is little to do except repeat previous expressions of satisfaction at the steadily improving prospects. We were able some time in advance to give some particulars about the policy of co-ordination and consolidation that the Corporation is pursuing with such good effect. This, as Lord Ashfield truly said, is an age of big businesses. Experience, especially in America and Germany, teaches the value of large combinations in order to utilise to the greatest advantage not only the plant and equipment but also the skill and enterprise of the personnel in research and manufacture. If his forecast is right the Corporation's future seems to lie in the direction of co-operation and possibly of consolidation with other large undertakings carrying on similar or nearly allied branches of the vast industry of chemical manufacture. It is from every point of view satisfactory to hear from Lord Ashfield that it is in that direction and not by a policy of isolation that the Corporation hopes to obtain the largest measure of success, not only for itself but for the country as a whole.

Books Received

INK MANUFACTURE. By Sigmund Lehner. London: Scott, Greenwood and Son. Pp. 212. 7s. 6d.

DIZIONARIO DI MERCEOLOGIA E DI CHIMICA APPLICATA. Vol. IV. Senapa-Zucchero. Milan: Ulrico Hoepli. L.50.

The Calendar

Aug. 4–11	British Association for the Advancement of Science. Annual meeting.	Oxford.
Sept 20–24	Chemists' Exhibition.	St. Andrew's Hall, Glasgow.

The London Congress of Chemists

Principal Features of a Great Programme

The Congress of Chemists, organised in connection with the annual meeting in London of the Society of Chemical Industry, opened in London on Monday and continued throughout the week. We give below notes and reports of the principal features.

Only One Criticism

ONLY one criticism is possible of the great Congress of Chemists which is meeting in London this week—and it is, perhaps, more of a compliment than a criticism. The programme is so full of attractions—scientific, social and dietary—that it is impossible for any delegate of normal capacity to absorb them all. If he succeeded, by a frantic effort to make the most of a week's holiday, he would certainly need to start another vacation immediately after. While the delegates naturally regret missing things that appeal to them, they nevertheless appreciate the efforts made to provide for every kind of taste. The London committee in charge of the arrangements has had an excellent leader in Mr. Garland, and nothing has been left undone to make the week pleasant and profitable for all. All the functions have been well attended, the Congress has had a particularly good press, and the newspaper representatives have distinctly appreciated the provision of a Press Bureau, where inquiries have been promptly attended to and comfortable facilities for writing have been provided. The London Congress of 1926 will go down as one of the biggest and best in the long series.

The Plant Exhibition

The moment the Plant Exhibition was opened on Monday morning it was pronounced good. More thorough inspection showed it to be very good indeed. It was much the most representative exhibit of British chemical plant ever attempted, and it was arranged in such a way that the characteristics of the various exhibits could be properly appreciated. The effect was both industrial and educational. Emphasis was placed on constructional materials, and the non-corrosive steels and irons attracted considerable interest. On Monday morning the exhibition was very well attended, but on subsequent days, when the members were engaged at meetings or social functions, the attendance naturally suffered. It seemed a pity that so good a show should be missed by anyone, but it was inevitable in so crowded a programme that some features should have to be sacrificed. What can safely be said is that those who inspected the exhibition were very much impressed with the quality and range of the chemical plant now being produced in this country. We have heard nothing but praise of the Institute Exhibition, but here, again, the matter for regret is that more have not been able to see it.

Sir Max's Model Speech

Among the various speeches of the week, that by Sir Max Muspratt in declaring the Plant Exhibition open was generally recognised as a model of conciseness and point. In the course of some ten minutes or so, speaking in very clear and practical terms, Sir Max covered all the essential points and supplied a sort of master key to all the problems that chemical manufacturers and users of chemical plant are coming up against, and therefore to the real meaning of the exhibition. As a great chemical manufacturer himself, he appreciates the full importance of acid-resisting metals and enamels, and in this connection particularly mentioned the pitch-lime concrete which was described for the first time in THE CHEMICAL AGE some time ago. The address was one of the few perfect samples of how to interpret highly technical matters in terms that can be understood; everything essential was noted, and there was hardly a word that could have been omitted without loss.

Business

There was nothing of special interest at the annual meeting of the Society of Chemical Industry, but the tone was united, and there was no jarring note. It was a disappointment to hear that the membership curve is still downward, in spite of the very hard work put in, but it is to be hoped that the concentrated attention now given to membership and finance will presently produce its result.

Mr. Woolcock retires from the presidency, which he has occupied for two years, on a high note. As Mr. Carr, the President-elect, stated in his tribute, the work of the retiring president is only fully known to his colleagues on the Council, and its results will last long after his term of office. The members' appreciation of that work was shown again and again in the most convincing fashion during the Congress, and Mr. Woolcock will have the satisfaction of looking back on services of permanent value to the Society and on associations of the most gratifying personal character.

The decision to hold next year's annual meeting in Edinburgh was unanimous. The hospitality of Glasgow in 1922 is still remembered, and the members will look forward with pleasure to another Scottish welcome in 1927.

"U-glow"

One of the novelties of this Congress is the issue of a daily Congress bulletin—"Published by the Publishers; edited by the Editor." We reproduce from the first number one of a series of cartoons done by Alfred Leete of the Savage Club. This, we are credibly informed, is not intended to represent the virile and versatile Mr. Woolcock of to-day; it is the artist's idea of what he may be like, say, fifty years onward, when, no longer young but still lively, he celebrates his centenary. It enables us to imagine the retiring president, at the London Congress of 1976, genially ambling into the Congress lounge, with friendly greetings to young fellahs of about 50 or so. "Well, old dears," one hears him saying, "not a bad conference, not at all bad. But, my word, when you talk of Conferences, my mind goes back to the great Congress of 1926. Nearly did me in. Never had such a time. And what workers! There was a perfect terror named Garland; there was Reavell, and Goodwin, and Tungay and ever so many more; good fellows, good fellows, all gone now. And there was a literary gent with a top hat; let's see now; began with an 's'; Stee-, Steep-; I've got it—Stephen Miall. Now, *he* could write about chemistry if you like. Well, well, boys, I must be off. Cheerio! Carry on! And don't forget the old 'uns did a bit in their day!"

"U-GLOW WITH SATISFACTION."

The Messel Lecture

The Messel Lecture by Earl Balfour, in the Mansion House, was from one side a success, from another a disappointment. As a function it was the chief feature of the week—a great audience, a distinguished platform, and

many notable personalities. But as a serious contribution to scientific thought it was almost negligible. Sitting in the great gilded chamber, one could not help contrasting it all with the plain simplicity of the surroundings in which the first Messel Lecture of 1922 and the second of 1924 were delivered at Glasgow and Liverpool respectively, by Professor Armstrong and the late Lord Leverhulme. On those occasions one completely forgot the surroundings in the nobility and power of the message. One felt that the two great men who spoke had explored the best and deepest experiences that life had brought them in their search for the worthiest offering they could make. Nothing less than the best they had known and thought sufficed as their gift for the altar.

It was just that fine note that was missing this year. The ceremony was perfect. Nothing was done that should have been omitted; everything was done just as it should have been. Only the most critical eye could have detected the slightest solecism. But in place of the Messel Lecture we had merely a very good speech about science by a great public man, who brought to this as to every subject he touches the charm and distinction of manner that Lord Balfour never fails to achieve. We say these things from a conviction that they ought to be said. The first Messel Lecture created a standard, almost a tradition. The second confirmed it. The third supplied us with a splendid function, but the Messel Lecture of 1922 and 1924 was missing.

The Discussions, etc.

The sessions arranged for the discussion of various subjects have been very well attended and the interest promises to be sustained to the end. The programme has included a number of dinners, receptions, garden parties, excursions, and visits to works, and by the time it comes to an end the members will have the pleasantest impressions of one of the busiest and most enjoyable in the Society's long list of annual meetings.

Opening of Chemical Plant Exhibition

Sir Max Muspratt on New Developments

THE Exhibition of Chemical Plant, organised by the British Chemical Plant Manufacturers' Association, was officially opened by Sir Max Muspratt (President of the Federation of British Industries) on Monday morning. Dr. R. Seligman (Chairman of the Association) presided, and there was a large attendance.

The CHAIRMAN, in his opening remarks, dealt with the history of the Association. It had its origin, he said, seven years ago, when the Association of British Chemical Manufacturers was already in full swing, and was obviously doing excellent work for chemical industry in this country. That Association was divided into groups, each of which was supposed to have similar interests, and it was suggested that a further group be formed consisting of manufacturers of chemical plant. For one reason and another, however, that could not be done, but an independent and affiliated organisation was created, *i.e.*, the British Chemical Plant Manufacturers' Association, to enable the plant manufacturers to work together, and, above all, to enable them to work in close intimacy with the chemical manufacturers, for the benefit of themselves and the whole industry.

The Duty of the Association

One of the means of giving effect to their objects was to give the widest publicity to the fact that in this country chemical plant in the greatest possible variety and of the highest possible quality could be and was being manufactured; it was the Association's main duty to bring continually before not only the chemical industry but also the wider public the fact that almost everything for which we had had to go abroad in the past could now be obtained in this country. There were still specialised products and machines for which we had to go abroad, but, generally speaking, almost everything could be obtained here.

The guiding principle of the exhibition was that it should be representative of as many different phases of chemical engineering as possible. There were two main classes of exhibits—materials particularly suitable for chemical engineering, and chemical plant and apparatus. Manufacturers of plant had shown remarkable enterprise, and those who had been unable to exhibit large apparatus through lack of space were exhibiting drawings and photographs. The Association had the interests of the whole plant manufacturing industry and the whole chemical industry well in view, and had not confined the opportunity to their own members, but had opened the doors widely to anybody who had anything of interest to show, provided it was made in this country. In a tribute to Sir Max Muspratt, who is President of the Federation of British Industries and of the Association of British Chemical Manufacturers, the Chairman said that his public-spirited work in civic, Parliamentary, and other directions had benefited in many ways the community of which he was a member.

Sir Max Muspratt's Address

Sir MAX MUSPRATT, in declaring the Exhibition open, congratulated the British Chemical Plant Manufacturers' Association upon their enterprise and energy in organising it. The chemical industry, he said, was one of the most ever-changing industries that had ever existed; its variety was such that, in comparison, Cleopatra must have been a marble statue, and it had grown and altered until people even of middle age felt entirely antiquated and out-of-date. He had seen the Le Blanc process, the ammonia-soda process, and the electrolytic process, in which engineering had played a larger and larger part; he had seen the ultimate end of the Le Blanc process, although engineering had given it a very much longer life than most people prophesied when the ammonia-soda process was first introduced. But those in all branches of chemical industry had to look to the great work of the chemical plant manufacturers to see them through. In the exhibition 40 firms of specialists were represented, and such an exhibition was highly useful for two reasons—first, as an example of what was being done and what could be done, and secondly, and far more than that, it was a stimulant of thought on the part of those engaged in chemical industry, even if they were not in any way engineers themselves.

There was a rooted antipathy between chemicals and metals, and the great work of the chemical plant manufacturers had been to overcome that antipathy. There had been almost as rooted an antipathy between the chemist and the engineer—(laughter)—but by the fine leadership and example of the Association, that was being overcome rapidly. The chemist and the engineer, and the chemical and the metal, must be made to meet, and the chemical plant manufacturer was the matrimonial agent who was going to cause the union to be both effective and most prosperous. An enormous amount was being done in connection with sulphuric acid, and one of the most striking instances was shown in the exhibition. The fact that he knew of a large sulphuric acid works—lead chamber works—making from 1,000 to 1,200 tons of sulphuric acid per week, and that that works had not a single boiler, but was run on electric power only, demonstrated the enormous progress that had been made in connection with chemical plant, and, he was pleased to say, with British chemical plant. The whole question of water was one of more and more absorbing interest.

The Coal Question

As to coal, we were learning to do without it; the miners and the mine-owners seemed to insist upon that. (Laughter.) The chemical industry had always adapted itself to new conditions, and he had no doubt that, if necessary, it would adapt itself to doing without coal altogether. The British chemical industry was built on cheap coal, and the German chemical industry was built on dear coal, but now the positions were reversed, and we had to approach all our old problems from an entirely different aspect and point of view. He was

satisfied that the chemical engineer would see the chemical industry through under every condition, and it was only by coming together and learning each from the other that we could achieve that result.

Amongst other most interesting exhibits were the enamel plant, which had made possible so many processes which were previously impossible; the silica ware, representing one of the most remarkable performances of modern times; and the pitch-lime concrete, which might alter radically the whole of our conceptions of the storage of acid and corrosive liquors.

Again, the step from laboratory discoveries to manufacture on a commercial scale was a long and arduous process, and many times disappointment and defeat resulted because it had not been possible to carry on the intermediate experiments upon which the large scale processes must ultimately be based. A number of British chemical plant manufacturers had been specialising not only in the large-scale plant that they were prepared ultimately to supply, but also in small laboratory experimental plants, by means of which all the problems relating to material and plant could be threshed out and the discoveries of the laboratory could be carried with all speed into commercial and industrial processes. Thus, the British Chemical Plant Manufacturers' Association was acting as liaison officer between the laboratory and the works, and he trusted every chemical manufacturer would see that the utmost advantage was taken of the facilities which were now offered.

High Pressure Work

There were two developments which he was certain would have their place in a future exhibition. The first was some contribution to the whole question of artificial textiles. Artificial silk, wool and other things, which were certain to come in the near future, offered problems to chemical engineering and chemical plant construction which were of the utmost interest, and infinite improvement, he was perfectly certain, could be effected. The second development was in connection with high pressure work. A good deal had been done in high pressure work on the Continent, and some had been done at Billingham, he believed, on an ever-advancing scale, but the infinite possibilities of high-pressure chemistry were such that it required a large number of the best brains of this country to be concentrated upon every single aspect of it. Chemists, engineers, and users of chemicals should see the exhibition, and he had the greatest pleasure in declaring it open. (Applause.)

Mr. J. ARTHUR REAVELL (Vice-Chairman of the Association), proposing a vote of thanks to Sir Max Muspratt, thanked him for the help he had given, as one of the great leaders of chemical manufacture, to the British chemical plant manufacturers. The chemical plant manufacturers of this country to-day, he said, were prepared to supply practically all plants that were required, designed by British brains and built by British brawn. A few years ago it was common to go to the Continent for any special chemical plant that was wanted, but that was no longer necessary. The Association looked forward to the co-operation of all manufacturers of chemicals, whether fine or heavy chemicals, or intermediates, and asked them for the opportunity of working with them, so that together they could provide the plant to fulfil the various requirements. It was impossible to provide plant off the shelf; it must be designed for its particular purpose.

Mr. M. PERRY seconded the vote of thanks.

Sir MAX MUSPRATT, responding, also proposed a vote of thanks to Dr. Seligman for his presence and for his work on behalf of the Association, for which he predicted a prosperous future. Dr. SELIGMAN suitably responded.

Institution of Chemical Engineers

Sir F. Nathan on Industrial Efficiency

The annual general meeting of the Institution of Chemical Engineers was held at the Central Hall, Westminster, on Monday morning, Sir Frederic Nathan (President) in the chair.

The PRESIDENT moved the adoption of the annual report and accounts.

Professor J. W. HINCHLEY (Hon. Secretary), commenting upon the Council's report, called attention to the fact that the membership has increased by about 20 per cent. during the past year and that the work of the Education Committee has made considerable progress with regard to the teaching of chemical engineering in the universities. More than one university, he said, was engaged in considering the subject and one had decided to take a definite step forward during the coming year.

Mr. F. H. ROGERS (Hon. Treasurer) presented the accounts and said that although there was a slight deficit on last year's working there was a small balance in hand, owing to a previous balance. The Institution was now in the fortunate position of being able to relieve the guarantors of their liability, and he expressed the thanks of the Council to the guarantors for their assistance.

The report and accounts were adopted.

The result of the ballot for officers and Council was as follows:—President: Sir Frederic Nathan, K.B.E.; Vice-Presidents—Sir Alexander Gibb, G.B.E., Mr. W. Macnab, G.B.E.; Hon. Secretary—Professor J. W. Hinchley; Hon. Treasurer—Mr. F. H. Rogers; Members of Council—Mr. C. S. Garland, Mr. H. Talbot, and Professor E. C. Williams; Associate Member—Mr. R. G. Browning.

The meeting approved of a modification in the Articles of Association with the object of slightly tightening up the conditions of membership. Cordial votes of thanks were passed to the President, Council, and honorary officers. The President acknowledged the vote of thanks and expressed his special gratification at being elected President for the second year.

Presidential Address

Sir FREDERIC NATHAN then delivered his presidential address, in which he dealt with the subject of "Industrial Efficiency, with Special Reference to the Elimination of Waste." The first part of the address dealt in some detail with the problems of industrial psychology and vocational training, and reference was made to the position of America in this matter, as set forth and explained in the report by Austin and Lloyd, two young engineers who visited the United States last autumn. In this same connection reference was made to various schemes that had been devised from time to time for reducing the cost of labour per unit of output. The work of Taylor, Gilbraeth and others in America was also drawn attention to and the opinion was expressed that in this country scientific industrial development is making slow progress due in great measure to the conservatism of employers and the distrust of employees to any changes in their working conditions. There were, however, very distinct indications that employers are realising in increasing measure the value of the application of scientific principles to industry and that organised labour was also tending in the same direction. In this way the physical and mental welfare of the human factor had come to be more and more recognised as an essential element of industrial progress.

Passing from labour, or the human factor, to material, Sir Frederic Nathan said that the question of economy in the consumption of raw materials had not, so far as he was aware, been the subject of much systematic investigation or general discussion. For that reason, therefore, he dealt with this aspect of the problem in the light of experience gained as Director of the Propellant Supplies Branch of the Explosives Department of the Ministry of Munitions. The Branch had control of the production of propulsive explosives in all the trade and in some of the Government factories; it also controlled the Government factories and the industries that provided some of the raw materials. A special section of the staff dealt with economy in the consumption of raw materials, which was imperatively demanded, in the first instance, on account of difficulties in obtaining supplies, and equally important on account of its effect in reducing the cost of production, since the cost of an article was a rough measure of the productive energy absorbed in its manufacture. To secure this economy of consumption a system was worked out under which the whole process of any given manufacture was divided up into units, and returns of consumption of material were submitted, from which significant efficiency factors for each unit were calculated. For some time the figures were unreliable, and to obtain greater accuracy it was found

necessary to carry out minor plant alterations which enabled accurate measurements to be obtained, and to seek out and eliminate various sources of error in collating the manufacturing data. After the system had been thoroughly established the manufacturers became convinced of the value of a close study of "process efficiency," as it was called, and of the marked success in reducing consumption of raw material per unit of output that attended its adoption.

Process Efficiency Control

To illustrate the effect of this process efficiency control, the following figures for 14 factories of consumption of nitrate of soda and SO_3 (sulphur trioxide) per ton of the two kinds of cordite in use were quoted :—

	Cordite M.D.		
	August, 1917. Tons.	September, 1918.	Per cent. Decrease.
Nitrate of soda.....	1·31	1·075	18·00
SO_3	1·42	1·115	21·48
	Cordite R.D.B.		
	August, 1917. Tons.	September, 1918.	Per cent. Decrease.
Nitrate of Soda	1·565	1·210	22·68
SO_3	1·665	1·275	23·43

The 1917 returns were in some instances not very accurate, probably giving a somewhat higher efficiency than was actually obtained, but the averages used in preparing the figures could be taken as fairly representing the consumption of nitrate of soda and sulphur trioxide. As illustrating the money value of this form of securing economy, it could be stated that the difference in the average efficiencies for August, 1917, and June, 1918, represented a saving at the rate of not less than £600,000 a year on these two raw materials alone, at the then rate of output. The trend of the results indicated that the saving would have been considerably greater if a similar calculation had been made at some later date.

Another instance of the application of process efficiency control was quoted. Owing to shortage of oils and fats, a glycerine process efficiency section of the Propellants Branch was constituted in March, 1918, to ensure the production of the maximum quantity of glycerine from the raw materials used by the soapmakers and fat-splitters. During 1917 the percentage of recovery was 73·89 for the whole of the firms engaged in the trade, whereas the percentage recovery for the period June to October, 1918, was 81·54, a saving of about 9·4 per cent. It was only fair to mention, however, that, especially in the case of the big firms, the recovery in the pre-process efficiency control period was below normal owing to the endeavour to put through as much raw material as possible when there was an abundance of it. The control also disclosed a considerable wastage of alkali and acid, which was remedied, and showed that many of the glycerine plants were badly designed.

Accurate Testing and Costing

This system, of course, required accurate measurements or weighings at every stage, and provision must be made for tests and analyses. Moreover, a well designed costing system materially assisted the object in view, whilst all important works should possess a small but specially trained process efficiency staff. Incidentally, it was mentioned that in the United States of America, at the instance of the Department of Commerce, a National Committee on Metals Utilisation had recently been set up to supervise the elimination of waste. Coming to the third element in manufacture, namely, the general charges concerned with the working of a factory or business, Sir Frederic said it was difficult to give a concise name to this. The term "on cost" was usually employed and denoted expenditure which could not be charged directly as material eventually entering into the finished product, and expenditure could be reduced to a minimum only by constructing and working a factory on thoroughly sound and scientific lines. The location of the factory in relation to suitable sources of raw materials, the lay-out, the supply of power and fuel, transport facilities, construction of buildings, the heating, lighting, ventilating, welfare services, etc., came under this heading and were all factors within the province of the chemical engineer. There were, however, many small factories unable to employ a chemical engineer or an expert in industrial psychology, and there were also many small industries in a similar position. Consequently, the question arose how industrial efficiency could be dealt with in these cases. There were several influential organisations in existence, such as the Federation of British Industries and the British Chemical Manufacturers Association, although he did not know to what extent their constitution would enable them to take up this matter of industrial efficiency in its relation to the elimination of waste. In many of the important industries there were research associations, and their objects would include the investigation of the problem of the elimination of industrial waste and the employment of suitable advisers for dealing with it.

A cordial vote of thanks was passed to the President for his address.

Chemical Engineers' Dinner

On Monday, July 19, the annual dinner of the Institution of Chemical Engineers was held at the Great Central Hotel. Sir Frederic Nathan presided over a large company. Sir Frank Heath proposed the toast of the Institution of Chemical Engineers, coupled with the name of Sir Frederic Nathan, the president. Sir Frederic replied for the Institution.

The Messel Memorial Lecture

The State and Science

On Monday afternoon, at the Mansion House, London, the Messel Medal was presented to, and the Messel Memorial Lecture delivered by, the Earl of Balfour. The Lord Mayor (Sir William R. Pryke) presided.

The Lord Mayor extended to the Society of Chemical Industry and allied societies and visitors a very hearty welcome to the Mansion House, and Sir William H. Beveridge (Vice-Chancellor of the University of London) offered a welcome on behalf of the University and other educational bodies in London.

Mr. W. J. U. Woolcock (President of the Society of Chemical Industry), in returning thanks to the Lord Mayor for his cordial welcome, gave a short sketch of the career and work of Dr. Messel, and explained that the Medal was being presented to Earl Balfour as a token of esteem from the scholars of one school to a very distinguished scholar in the school of life.

The Duke of York, in presenting the Medal to Earl Balfour, remarked that though he had not yet had many opportunities of seeing something of the industry which played such a great part both in peace and war, he remembered a visit to the Chemical Section at Wembley, where the President had shown him what seemed to be a very good representation in miniature of British chemical industry. He was very glad to be present on an occasion when the Society was conferring upon Earl Balfour the highest honour it was in its power to confer. The choice of the Council would receive universal endorsement, and it gave him very great pleasure to hand to Earl Balfour the Messel Medal of the Society.

The Lecture

The Earl of Balfour, upon receiving the medal, said he must admit that if quite impartially he surveyed his own qualifications for the honour he found them very defective. It was quite true that perhaps of his family one member at least had been greatly distinguished in science ; it was quite true that as an outside amateur he himself had all his life been interested in science ; and it was quite true that he had used such opportunities as public life had given him to further the interests of scientific research, and to utilise the immense resources of all kinds which science was giving mankind in every walk of life. (Hear, hear.) Another qualification, of an official kind, was that he happened for the time being to be the head of the department of Government which more than any other department concerned itself with industrial research, and as the president of their society had very happily remarked, the society which had chemistry for its subject had one foot in industry and one foot in scientific investigation. That precisely described some of the duties which his department had placed upon it, and which it was endeavouring to the best

of its ability to fulfil. The relation of Government to scientific research must always be a difficult one, and must always lend itself to a certain amount of controversy. To attempt, he thought, to embody it accurately in any given formula would only lead to difficulties. But undoubtedly the Government could be helpful, and had performed great services for the public in that connection.

If one reflected upon the character of the connection between science and industry it seemed to him to be roughly of this kind: you had men of genius, wholly unconnected with industry, moved by nothing except the desire to further knowledge, possessed with an insatiable curiosity, and with that kind of genius which enabled them to penetrate a little further into the innumerable secrets of nature. To them fell the glory of making discoveries that lay at the root of all our knowledge of nature, and of all our powers of turning nature to account. Such men seldom received any great meed of the world's goods, but to them everyone, whatever his position in the social organisation, owed everlasting thanks. The next stage perhaps might be described as the intuitive. Some man of constructive ability might see in the discoveries made by pure science the foundation of some great practical application, and in his investigations he certainly found obstacles. If successful, he proceeded from the laboratory experiment to the full scale unit. The third stage was generally the providing of a factory with the organising of markets, and all those collateral efforts which were required before full fruition was reached.

The Sphere of Government

Where in that process did the legitimate sphere of the Government effort come in? Governments could do little or nothing to further fundamental discoveries. It was not their business to travel to the other end of the process and to find the capital which industry ought to supply for producing full scale apparatus, or for building factories and providing marketing facilities. The best fields for Governmental efforts necessarily lay in the middle region. He would not, however, exclude their efforts in laboratory experiments, but it should be left to the enterprise of individuals to carry to a successful financial result what had ceased to be an investigation into pure truth, and had become, instead, a great commercial effort which might or might not be successful. If we observed how science in industry was applied in Germany and America, and compared the position in our own country, were the results of our investigations wholly satisfactory? During the last quarter of a century he had seen no falling off in the manner in which men of science in Great Britain had furthered knowledge in fundamental matters. Nobody was going to make money directly out of the modern theories of the constitution of the atom. In that which was the foundation of any subsequent superstructure of scientific discovery we did not show any failure to bear our full share in the common task of civilisation—the task of furthering human knowledge and human command over the resources of the world.

But when we considered how the applications of science were made; where they were best met, and produced the most fertile results, he must frankly own that so far as he could judge we had not shown ourselves, and were at this moment not showing ourselves, the equals of some of our friends and competitors. Some people might think that this country was under some disadvantage in the fact of its being very small in point of area, and that it did not possess, apart from the other parts of the Empire, those material resources which no doubt were an essential of successful industry.

Coal and Coal Products

Coal supplemented by air and water was more and more becoming the material of some of the most valuable products of human industry. For instance, the great process of synthetic ammonia, which had only come into being since the war, was now a vast and a growing industry, ministering to agriculture and other things. It required essentially nothing except coal, water, and air. The most valuable insulators for electrical works and the most charming handles for ladies' umbrellas, carved or moulded and of admirable texture, were made from the same three constituents. Speaking of coal as the foundation of new fuels to replace natural oil, Lord Balfour said much was expected from the process of the low temperature carbonisation of coal, but he could not resist the suspicion that it was not so much in that direction that we should have great fuel developments as in some process that would lead to the direct hydrogenation of coal. Sooner or later he was convinced that would be accomplished. The fault of the public was that they knew nothing whatever of science or the resources of science, and that when they were told science was on the way to do something—this or that great discovery—for the benefit of mankind, they always seemed to think it was going to be done the day after to-morrow. (Laughter.) These things were not done in a day, but they were done in time. He did not doubt that sooner or later—and it might be sooner—we should see a great development which would show how enormously this country, poor as it might seem in a certain variety of raw material, had nevertheless the kind of raw material from which the chemical industry could give us products of the most varied kind, and thereby immensely further not merely the prosperity of great corporations and give employment to vast numbers of workers, but add to the comfort of every individual within our narrow and crowded frontiers. (Cheers.)

Foreign Inventions

Of modern and striking inventions that were successful or on the road to success most were of foreign origin. The relation between scientific results and practical industry required serious consideration. A scientific process commercialised needed perpetual adjustment, and demanded an immense supply of trained technical assistants. In some cases we found it impossible to hold our own against competitors, not because we had any material disadvantage to contend with, but because, for some reason or another, we did not use to the best advantage the resources which were in a measure at our disposal. He was certain that to conduct great modern developments of industry needed not only ability and probity but scientific imagination. He was not making an attack upon the great business community of this country—far from it. He yielded to none in his admiration of their business capacity, their incomparable directness, and their moral and intellectual qualities, which had given them a special place in the economic working of the world. He thought, however, they were in some respects in some quarters lacking in that combination of special scientific knowledge with the broad and imaginative outlook which was more or less possessed by some great industrial countries with whom we were brought into the closest relations not merely of friendship but competition.

On the motion of Dr. E. F. Armstrong, Mr. C. S. Garland and Mr. W. J. U. Woolcock, votes of thanks were accorded Earl Balfour, the Lord Mayor, and the Duke of York respectively.

Annual General Meeting

THE annual general meeting of the Society was held on Tuesday, with Mr. W. J. U. Woolcock (the retiring President) in the chair.

Officers and Council

The following were unanimously elected to fill the posts indicated:—

President: Mr. Francis H. Carr; Vice-Presidents: Professor P. P. Bedson, Dr. Bernard Dyer, Sir James Walker, F.R.S., and Mr. W. J. U. Woolcock. Ordinary Members of Council: Mr. D. Lloyd Howard, Dr. Percy May, Dr. E. W. Smith, and Mr. John H. Young.

Report of Council

The annual report of the Council showed that the membership on July 20, 1926, was 4,802, compared with 4,831 on July 14, 1925. Since the last annual meeting, 367 members had been elected, and the losses through death, resignation, etc., were 396. The suspension of the entrance fee in 1925 had been continued during 1926. Mr. E. V. Evans and Dr. H. Levinstein had been re-elected hon. treasurer and hon. foreign secretary respectively.

President's Address

Mr. WOOLCOCK then delivered his presidential address, which took the form of a brief review of the work of the

Society during the two years of his presidency. It had been his aim to encourage and extend in every possible way the scheme of co-operation with allied societies which had been consistently kept in the forefront of the Council's policy for a good many years. This co-operation, which had been carried on successfully in the past, had been gradually extended in scope, until this year they had, for the first time in the Society's history, been able to make the annual meeting the nucleus of a Congress of Chemists, representative of sixteen scientific and technical societies and associations in addition to the Society itself. The cordial co-operation which had been shown among these bodies on this occasion augured well for the future of British chemistry, and he expressed his appreciation to the other bodies. There was another body with whom the Society would very much like to be associated, namely, the Electrical Engineers. Perhaps they might accept what he was saying as a " gesture." He would be very willing to approach and ask them for their co-operation, particularly with reference to the Society's fuel policy, and he had every hope that if such a " gesture " were made it would receive a most friendly response.

As to membership, he was sorry that it had continued to diminish, although not to the same extent as it had done three or four years ago. It was with sorrow that the Council noted the heavy toll which death had taken of the members. With regard to withdrawals, in a very large number of cases these were due to lack of employment, and in many cases to members changing their profession. During the past two years 90 persons had taken advantage of the concession made under the scheme whereby applicants for membership under the age of 25 years were entitled, under certain conditions, to pay a reduced subscription until attaining that age, or for three years, whichever was the longer period. He felt that this policy was the right one, and that nothing which could be done to assist the younger chemists should be left undone. He also considered that the Council was quite right in suspending the entrance fee previously payable by new members.

Dealing with publications, he said the Society had now published ten volumes of annual reports of the Progress of Applied Chemistry, as they believed that these served a very useful purpose as records of the results of research accomplished year by year. In the last published volume the Oil and Colour Chemists' Association had co-operated with the Society in the preparation of the report dealing with paints, pigments, varnishes and resins, and the Institute of Brewing in connection with the report on fermentation.

With regard to the newly-formed Fuel Section, he emphasised that it would co-operate with the local sections, and would join with them in arranging meetings at which matters relating to fuel research and practice would be discussed. It had entered into an arrangement with the Coke Oven Managers' Association and the Institution of Gas Engineers, by which the three bodies would unite in holding special symposia of a technical and scientific nature when of common interest. Towards the close of this year the Society would hold a conference in Manchester on " Tar."

Finally, he acknowledged the kindness and assistance extended to him by the members of the Society, the staff, and his colleagues on the Council, and said he would always look back on his two years of office as President with the greatest possible pleasure.

Treasurer's Report

Mr. E. V. Evans (hon. treasurer), presenting the accounts for 1925, said that whilst the expenditure had been reduced, the accounts showed a deficit of £1,274 for the year, due partly to a fall in revenue. On a general review of the position, he said the financial position to-day was about what it was in 1919.

On the motion of the President, seconded by Mr. Evans, the report and accounts were unanimously adopted.

Annual Meeting for 1927

On the motion of the President, seconded by Dr. J. A. Cranston, it was unanimously resolved to accept an invitation by the Edinburgh and East of Scotland Branch to hold the annual meeting next year in Edinburgh.

Vote of Thanks

Mr. F. H. Carr (the newly-elected President), in proposing a vote of thanks to Mr. Woolcock for his work on behalf of the Association during his two years of office as President, said that in presidential achievement he stood second to none and superior to many of the long list of distinguished Presidents. So great had been his success that every member of the Society must feel that they had benefited from his Presidency, and that in him they had a friend, but only those who were members of Council could know the immense amount of remarkable work he had done on behalf of the Society. The full effects of all that he had done would not be known for many years to come. The present meeting was a great event, and represented a fitting culmination of the object which he had had in view throughout, namely, the co-ordination of all allied societies, whilst insisting on the retention of the individuality of each. He hoped Mr. Woolcock would be spared to go on to other achievements equally great, and even greater.

The vote of thanks was accorded with acclamation.

Mr. Woolcock, responding, expressed his gratitude for the honour the members of the Society had done him, and for the kindness and support they had extended to him.

A vote of thanks was also accorded to Mr. Evans for his services as hon. treasurer throughout a difficult financial period.

Important Symposium on Corrosion

Technological Critics at Work

On Tuesday morning a Symposium on Corrosion was held under the auspices of the British Chemical Plant Manufacturers' Association, the Institute of Metals, the Institution of Chemical Engineers and the Chemical Engineering Group of the Society of Chemical Industry.

A number of papers were read. Mr. Ulick R. Evans dealt with " Fundamental Principles of Corrosion " ; Dr. W. H. Hatfield with " Resistant Steels for Chemical Engineering " ; Messrs. T. G. Elliot and G. B. Willey with "Chemically Resistant Steels, with Special Reference to Very High and Very Low Temperatures ;" while Mr. Parrish contributed two papers. The first dealt with " Corrosion and Erosion of Centrifugal Baskets, Spindles, etc." The second paper by Mr. Parrish was entitled " Notes on the Corrosion and Erosion of Chemical Sheet Lead," and in view of the great interest which it aroused is reproduced below.

Large quantities of chemical sheet lead [the authorstated) are used in the construction of sulphuric acid chambers and ammonium sulphate saturators. For both purposes purity is of vital importance. Pattisonian refined chemical sheet lead is to be preferred to that manufactured by the Parkes process. Practical trials, where a certain number of Pattisonian refined sheets constituted one side of a chamber, and where a similar number refined by the Parkes process formed part of the other, have revealed that the loss has been 6–10 lb. of lead per ton per annum in the case of the former, while 15–20 lb. per ton per annum represents the loss with lead refined by the Parkes process.

It is known that opinions differ about the importance of purity of chemical sheet lead. Some affirm, with the writer, that purity is of vital importance ; others hold the view that small quantities of antimony and copper improve its resistant properties. One suspects that the results of flash tests of chemical sheet lead have influenced certain chemical engineers to favour the introduction of small quantities of copper.

Too much importance appears to be attached to the decomposition temperature of chemical sheet lead. This test is certainly important where the lead has to be used for sulphuric acid concentration pans (a very rare requirement in these days), or for the dish or saucer of a Glover tower. But it is less significant where it is proposed to use the lead for the side of a Glover or Gay Lussac tower, or for the construction of sulphuric acid chambers or ammonium sulphate saturators.

What bearing has the incipient attack on chemical sheet lead by sulphuric acid at temperatures over 200° C., when the chemical sheet lead is to be used for purposes where the temperature rarely, if ever, exceeds 110° C. ? If more attention were given to purity, and less to the flash test, an improved

quality of lead would conceivably be obtained. What chemical engineers must know initially is the content of lead in the sheet lead. This should not be less than 99·99 per cent.

The wisdom of adopting a specification where the lead content is dependent to an extent on the content of copper present, is open to question. Particularly is this the case when the chemical sheet lead is intended for sulphuric acid chambers and for sulphate of ammonia saturators. Many chemical engineers object to the presence of so small a quantity as 0·05 per cent. of copper, when the chemical sheet lead is to be used for the construction of ammonium sulphate saturators. Anyone who is familiar with the heterogeneity of structure and properties caused by the presence of impurities, or by changes during solidification, mechanical treatment or effects of heat, must deprecate the presence of impurities, whether deliberately added in small quantities, or otherwise.

Manufacture and Testing of Lead

An attempt should be made to standardise practice at works manufacturing chemical sheet lead. Is virgin pig lead always used, when chemical sheet lead is being prepared? Does remelted pig lead, which may contain varying amounts of regulus metal and other impurities, never find its way to the melting pot? Again, having ensured *the very finest quality of pig lead*, attention should be given to the method of melting it in the pot. To what temperature should the lead be raised? Should the metal be agitated at a specific temperature, and special arrangements adopted for removing the impurities? How many skimmings should be made?

In this connection it should be remarked that the presence of oxides which may become rolled into the sheet causes local corrosion. It has been suggested that the effect of sodium, the use of which in minute quantities has been recommended, is to reduce the quantities of oxide present.

What test should be applied to determine when the metal is in a suitable condition, chemically and physically, to be tapped to the casting plate? If the molten metal is to run to the casting plate at a too high temperature, a loose crystalline structure will be given to the metal, thus resulting in leakage; if the block is cast at a too low temperature, there is a possibility of lead setting in layers, and the sheets possessing a laminated structure.

At what temperature should the block be lifted? Have any specific pressure and temperature yet been decided upon as the best for rolling? Does an excessive pressure produce a surface which is more readily susceptible to attack? Are the best sheets of lead obtained when the block of lead has a specific temperature?

Correlation of Tests

All the last-named factors have an important bearing on the physical character of chemical sheet lead, and it is felt that sample sheets, prepared under well-defined conditions, and put to practical trials at chemical works for certain specific purposes, would add materially to our knowledge. There should be a definite attempt to correlate the results of such tests.

Where tests are applied to determine the suitability of chemical sheet lead for certain purposes, it is important that they should be comparable with the practical conditions which obtain. It is far better to apply an exposure test in one or more acid chambers, and to determine the loss per unit area exposed, over a given period, than to adopt (say) a nitrosyl-sulphuric acid, *aqua regia*, or other such test.

In this connection it should be remarked that lead sulphate has a very important protective influence on chemical sheet lead. Below are given results of pieces of lead which were suspended from a glass rod in the last chamber of a sulphuric acid plant for a period of one day, and for further periods.

	1 day period.		1—6-day period.	
	10 lb.	20 lb.	10 lb.	20 lb.
Surface area	65·17	67·53	65·17	67·53 cm².
Original weight of piece	148·086	253·625	148·086	253·625 grms.
Final weight at end of test period.....	148·027	253·552	147·235	252·550 grms.
Loss in weight	0·059	0·073	0·851	0·125 grms.
Loss in Mg. per cm² during test period	0·90	1·08	13·00	1·85 mg.
Average do. per day ...	0·90	1·08	1·86	0·264 mg.

The foregoing tests are particularly interesting in that the chamber gases practically ceased to have any action after the first day's exposure. This immunity from attack obtained not only over a subsequent six-day period, but over several weeks. It is a phenomenon which has been observed in connection with many qualities of chemical sheet lead, and it is one which is not likely to be revealed by tests such as the nitrosyl-sulphuric acid or *aqua regia* tests.

Ammonium sulphate saturators suffer loss of weight more from erosion than from corrosion. It is important that there should be a well-defined agitation in the saturator. The velocity of the gases through the cracker, or distribution pipes, should be such that deposition of sulphate of ammonia is avoided. But this velocity should not be such that the crystal structure is impaired.

Some continental works line their saturators with special tiles, with a view to reducing the effects of erosion. Many cases of saturator corrosion have been investigated, and in one or two instances it has been found that the presence of cresols in the acid sulphate magma has been at least partially responsible for the attack.

Application of Tests

It is one thing to attempt to standardise chemical sheet lead; it is another and different thing to ensure that standardised chemical sheet lead is always supplied. With the best ntentions in the world, it is conceivable that chemical sheet lead may be despatched which fails to conform to the specification.

What is certainly difficult is the ability to apply the various tests which one intends to impose on every sheet of lead, when one is receiving within a short period three to four hundred sheets, for the construction of sulphuric acid or other such chemical plant.

The writer is convinced that purity is of vital importance in the selection of chemical sheet lead, but he would not altogether disregard the results of subsidiary tests, made under conditions which are comparable with those which are likely to obtain in practice.

The addition of predetermined small quantities of copper may have a corrective effect when antimony is present in chemical sheet lead. It may aid the sale of chemical sheet lead by improving the results of the flash test, but to decide upon a certain quality of chemical sheet lead, say, for sulphuric acid chambers, or for ammonium sulphate saturators, merely on the basis of the flash test, would, in the writer's view, be unsound. A copper free chemical sheet lead is preferable for many purposes to one containing a small quantity of added copper.

Points from the Discussion

Dr. Walter Rosenhain (National Physical Laboratory) commented on the statement in Mr. Evans's paper that sometimes burnishing or polishing a metal made it more resistant to corrosion, and said that might be of greater importance than it appeared at first sight. If the surface of a metal was made resistant in that way, it was due to two causes. One was the removal of porosity by mechanical means by flowing the metal in such a way as to fill in all the interstices, and the other was an actual change in the constitution of the metal itself. Both might even play a part, and if that were the case, it was not impossible to imagine a state of affairs in which it was possible to convert the greater part of the metal into that condition. With regard to the point in Mr. Parrish's paper as to the use of rolled or forged Monel metal, he was probably right in his suggestion, based on his practical experience, but there were many cases in which casting was necessary, and he himself ventured to suggest that sufficient care taken in the production and subsequent treatment of the casting would overcome many of the difficulties of which Mr. Parrish had spoken. For instance, the coarseness of the structure could sometimes be modified by subsequent heat treatment. It could always be modified by modifying the conditions of casting, by, for instance, de-gasifying the metal and casting it under conditions such as to produce the maximum density in order to eliminate porosity as much as possible. In such circumstances, a great many of the differences which Mr. Parrish had found to exist between the rolled material and the cast, would disappear. It was a question of improving the technique of casting.

In regard to the lead question, he thoroughly sympathised with Mr. Parrish that there was no test of a pudding except that of eating it, but when they had to buy puddings on a large scale, it was a rather different matter. Therefore, the

poor B.E.S.A. Committee—of which he himself, by the way, was not a member—had to find some form of acceleration test. Such tests were always thoroughly unsatisfactory, but sometimes they were the only thing possible. At the same time, in the case of lead he ventured to suggest that Mr. Parrish was right when he said that the casting conditions were not sufficiently considered, and that the real trouble was not the question of the elimination of impurities, but a question of soundness of the casting, a question of securing the absence of enclosures and securing a thorough sound block. This whole problem required a great deal further elucidation, because he doubted whether the minute quantity of impurity which Mr. Parrish had mentioned had any effect, for it would be present not in the crystal boundaries, but would be scattered atomically throughout the crystals, and it was difficult to see how it would produce the marked effects referred to in Mr. Parrish's paper. Finally, with regard to high resistant steels, these would become more valuable and of increasing usefulness when the price became more reasonable than it was at present.

Mr. SIDNEY J. TUNGAY, commenting on Mr. Parrish's paper on chemical lead, said that Mr. Parrish seemed to have cracked a very small nutshell and found inside a very large nut. As a member of the B.E.S.A. Committee for the standardisation of chemical lead—which Mr. Parrish had criticised—perhaps it would be fitting that he should say something in reply. Mr. Parrish had said we should have 99·99 per cent. purity, and that, first and foremost, was what the Committee had endeavoured to do. When the Committee came to investigate the samples of lead which had been used industrially for quite a number of years, however, they found these samples in many cases to be coppery lead, and they stood the action of sulphuric acid and hot sulphuric acid extremely well. Moreover, these copper rich leads showed less tendency to creeping when used for the construction of sulphuric acid chambers and when used for the concentration of sulphuric acid, than the purest chemical lead and, therefore, the Committee had to vary its opinions. It appeared that the presence of some copper in the lead was by no means necessarily deleterious. There was another factor which had arisen from the work of the Committee. These leads had been investigated by the Committee for two years, and it had been found that in order to give a 99·99 per cent. metallic lead it was necessary to determine very closely what the remaining 0·01 per cent. of impurities should consist of. Sometimes a very slight inclusion of an impurity would result in a breakdown very rapidly when the material was used for the sulphuric acid chamber process, and all sorts of things happened quite different from anything that was anticipated when these leads were investigated. Thus Mr. Parrish had launched against the Standardisation Committee certain blame which, perhaps, did not altogether attach to them. It was said that the Committee might have given more attention to the preparation of lead, to its rolling and manipulation, and the question of the origin of virgin lead. At some of the sittings, the Committee wondered what virgin lead really was. It was also suggested that the Committee should forbid the inclusion of old lead, but it was not the province of the Committee to dictate to the manufacturer how he should prepare the lead. The manufacturer had to produce a lead of, say, 99·99 per cent. metallic lead, and it might contain even a fractional amount of copper. It had been suggested by Mr. Parrish that the Pattisonian or the Parkes process should be adopted, but it was not the province of the Committee to so arrange the standardisation of lead that only one or two manufacturers would have the opportunity of making it. Otherwise the chemical manufacturer would complain that the price was raised unduly against him. The whole point was that the Committee had very little data to go upon in regard to this matter. Scarcely anything had been done in regard to lead, and if he might throw out a suggestion to the Congress, it would be that some of the metallurgists and experts should give a little more attention to the problem of lead used in chemical engineering and chemical industry, so that more work might be done for the benefit of the manufacturer and the user.

Mr. PARRISH said he was glad his second paper had led to the defence of the B.E.S.A. Committee by Mr. Tungay, which, after all, was nothing at all, because it was useless to attempt to standardise the manufacture of chemical sheet lead from the point of view of the chemical manufacturer when it was obvious that the manufacturer of the lead was the ignorant party in the dispute. By corrosion he meant chemical action and by erosion he meant mechanical action. The remarks of Dr. Rosenhain with regard to casting lead went to the root of many of the difficulties that were encountered. In the paper he had made it perfectly clear that the variable factors arising in the works should be correlated, so far as they were useful in connection with sulphuric acid. It was only by progressive elimination that we should be able to arrive at useful results.

A number of other speakers also took part in the discussion.

"Chemistry House"

Dr. Miall Explains the Scheme

ON Tuesday afternoon a discussion took place on "Chemistry House," arranged by the British Association of Chemists.

Mr. W. J. U. WOOLCOCK, who presided, said that there was really no controversy as to the desirability of having a Chemistry House which would embrace all the societies relating to chemistry and chemical industry; the only problem for discussion was the ways and means of carrying out the scheme.

Dr. STEPHEN MIALL made it clear that although he happened to be one of the honorary secretaries of the Federal Council, which had been studying this question for three or four years, he was speaking only in his private capacity and in no way would anything he said represent the views of any of the bodies which might be concerned in a Chemistry House. This subject had been discussed for something like ten years. It attracted considerable attention after the war, when Lord Moulton interested himself in the matter and, in fact, a scheme for raising £250,000 was ready to be launched at the time of Lord Moulton's death, when the industry was flourishing and there was a certain amount of money likely to be available for such a purpose. Then came the slump in trade and nothing more was done until Dr. E. F. Armstrong brought forward a scheme in 1924 which involved an expenditure of from £25,000 to £35,000, sufficient to enable all the important chemical societies to be given office accommodation, lecture hall, etc., in one building. These were things urgently needed although the original scheme included library accommodation and social facilities such as those afforded by the Chemical Industry Club. These latter, however, would have to wait. His own opinion was that an endeavour should be made to start the smaller scheme and to build the larger one, which might be in 10, 15 or 20 years time, upon these smaller beginnings because he did not believe it would be possible at a time like this to obtain from the industry a sum anything like £150,000 to £250,000.

The Question of Subscriptions

Dr. H. LEVINSTEIN (who now took the chair) agreed with starting the smaller of the two schemes, but thought that there would be greater prospect of its success if some definite saving could be shown by it. For instance, there ought to be considerable savings in administrative expenses on the part of the various societies who would be housed in Chemistry House, and it might be possible to have one subscription covering all the societies rather than the large number of subscriptions, which were now necessary if the members of the industry were to keep themselves thoroughly up-to-date. He could not help feeling that one thing necessary for the younger members of the profession was a reduction in the subscriptions they were called upon to find for the various societies in chemistry and chemical industry, and it appeared to him that some centralised administration ought to bring about that result.

Dr. FORSTER suggested that one means for obtaining funds would be to secure annual subscriptions from various people for a number of years, and with that end in view it was desirable that a Committee should be appointed to draw up a scheme, no matter how small, to start the project, such a Committee to consist of the Chairmen and Secretaries of the various societies.

Mr. GATEHOUSE could not hold out much hope of subscriptions coming from the rank and file at the present moment, unless there was a considerable reduction in subscriptions. At present the subscriptions to necessary societies on the

part of a works' chemist represented about £15 per annum, whereas the average salary of a works chemist was from £300 to £350 per annum.

Dr. W. R. ORMANDY said it was very desirable to have some concrete scheme showing exactly how much was going to be saved rather than the generalities to which they had been listening. It must not be overlooked that the Chemical Society was paying no rent and that many of the other societies were run gratuitously in the rooms of the universities, and so on. Therefore, the region for saving in this direction was comparatively small. Moreover, the accounts of the various societies showed that printing was a very large item, and there was not much prospect of saving in that direction, whilst it was rather dreadful to think of having all the proceedings of the various societies in one volume instead of in a number of volumes as at present. In any case a definite scheme must be put forward before there would be any prospect of success.

A Palais des Sciences?

Professor H. E. ARMSTRONG described the meeting as entirely premature, and suggested that nothing should be done until it was possible to do something on the lines of what was seen on the Continent. For instance, in Brussels there was a Palais des Sciences. He deprecated any small scheme because it would prevent the bigger scheme from being developed in the future.

Mr. COLLETT suggested that one way to secure funds was to establish a trust consisting of the president and treasurers of the big chemical bodies and to go on quietly building up a fund in that way.

The CHAIRMAN asked whether this suggestion might be put in the form of a resolution, but it was the general opinion of the meeting that this should not be done.

Dr. MIALL, in a brief reply, said he agreed with Professor Armstrong that this meeting was to a certain extent premature. He did not think it would be possible to include in any such scheme as Chemistry House arrangements for one subscription to all the societies. It was always a difficult matter to carry through schemes dealing with the organisation and co-operation of various societies, and Chemistry House in itself was a sufficiently difficult problem. For the next few years these two matters would have to be kept entirely separate. At the same time if they were going to wait until there was to be a real Palais des Sciences as suggested by Professor Armstrong, they would have to postpone the discussion probably for another 15 or 20 years.

Notes on the Chemical Plant Exhibition

A Fine First Effort

APART from its intrinsic material importance, the exhibition held this week by the British Chemical Plant Manufacturers' Association has a profound significance psychologically. At a time when specialisation is increasingly regarded as a necessary adjunct to scientific and technical advances, this recognition of chemical plant manufacture as a separate industrial entity marks an important step forward. The discovery of the fact that a definite problem exists is usually the prelude to its successful solution.

The exhibits displayed showed that our plant manufacturers are well abreast of the times; in this department of industry we have nothing to fear from abroad. British engineering has always commanded world-wide respect, and its chemical branch is living up to the high standard set for it. Independence of thought is a very essential thing, and no advances of any value can be made without it. At the same time, it is a serious mistake to split an industry into watertight compartments, and the importance of collective action is clearly recognised by the statement of the Association that one of its objects is "to promote closer co-operation between British chemical plant manufacturers, and the interchange of information amongst its members." The future historian of the British chemical industry will, we think, clearly recognise that the formation of the British Association of Chemical Plant Manufacturers and of the Institution of Chemical Engineers were two of the most important landmarks of this generation. Indeed the clear recognition of chemical engineering as a special line of activity is likely to have as great a catalytic effect in industry as had the birth of physical chemistry in the realm of pure science.

What of the future? It is to be presumed that the Association will act as a clearing house for information. There seems to be no reason why it should not ultimately go one step further. Why not a Research Association of the British Chemical Plant Manufacturing Industry? It is true that the problems to be faced by the industry are very numerous and complex, and the field of operation vast. These facts, which seem on superficial examination to be stumbling blocks to the formation of a research association, really prove, on a more careful view, to be cogent reasons for its institution. Perhaps, the creation of a research association is not immediately possible. The formation of the Plant Manufacturers' Association was itself attended with certain difficulties, and the members may take the view that it is unwise to attempt to run before they can walk. But even if an independent research association cannot be created, it might be worth while to form a special branch of an already existing research organisation, or at any rate to establish contact with research organisations whose work touches on chemical plant problems. In this connection the newly instituted Chemical Research Laboratory at Teddington suggests itself as a possible (if necessary, temporary) headquarters. The formation at the Laboratory of a Department of Chemical Plant Research seems quite feasible, and perhaps the members of the Plant Manufacturers' Association would be prepared to consider offering some financial support to such a department. In opening the Chemical Plant Exhibition, Sir Max Muspratt referred specifically in his address to the importance of high pressure work, and Dr. G. T. Morgan, the head of the Chemical Research Laboratory, is understood to take a special interest in this field of research. This question of the formation of a Research Association will, in any case, require long and careful inquiry and organisation, and there are doubtless many considerations to be taken into account that do not appear on the surface.

Corrosion-Resisting Metallic Plant

A special feature of the exhibition of plant was the number of exhibits of corrosion-resisting materials and plant.

T. FIRTH AND SONS, LTD.—The exhibit featured "Staybrite" steel in the form of a large number of articles which can be manufactured from it. The resistance of the metal to corrosion was demonstrated by showing that cylinders of it could be heated in various acids and other chemical agents without suffering injury. "Staybrite" steel is being used, among other uses, for the construction of nitric acid plants.

HADFIELDS, LTD.—The company displayed their new anti-corrosion steel, "Era C.R.," which is now on a production basis. Its resistance to various corrosive media was demonstrated. A rotor made of "Era A.T.V." steel was shown, such a rotor having been worked continuously at 800° to 900° C. while running at 30,000 revs. per minute. There was a demonstration of the treatment of heat-resisting steel in a furnace, showing that it did not scale. Comparison specimens showed the immense superiority of "Era A.T.V." over cast iron as a material for furnace racks. Other applications of heat-resisting steels indicated their use as muffle-linings, trays, etc. There were exhibits of Hadfield's hardened steel rolls and crushers. An exhibit of great historical interest showed the great advances from ancient times down to the present in the corrosion-resisting properties of steel.

THE LENNOX FOUNDRY CO., LTD.—At this stand was a display of the anti-corrosion and erosion materials, tantiron, tantcopper, tantnickel and tantlead and of apparatus made from these. Among other things were a tantiron centrifugal pump for acids, giving up to 10,000 gallons per hour; tantiron steam-jacketed basins; tantnickel centrifugal filters; tantlead cocks, etc. The company also showed their iron "Lennox" laboratory blowers.

G. AND J. WEIR, LTD.—Corrosion-resisting apparatus made of Monel metal was exhibited. There was a centrifugal separator for drying sulphate of ammonia, as used in gasworks, similar apparatus being used also in dyeworks; a large Monel

metal lining, 6 ft. deep and 4 ft., of a steam-jacketed mixing pan for dyes; Monel metal valves; a Hurrell homogeniser lined with Monel metal, for pharmaceutical and foodstuff work; and other Monel metal apparatus.

BROWN BAYLEY'S STEEL WORKS, LTD.—At this stand were shown various types of stainless steel and iron and products manufactured from them. "Twoscore" steel is used for cases where severe electro-chemical action is likely to be encountered, *e.g.*, through contact with brass, bronze, etc., while immersed in an electrolyte such as brine, and is also resistant to many corrosive agents. "Anka" steel, an austenitic steel, has greater powers of resistance, particularly to acids. "Hotspur," also an austenitic steel, has the special property of resistance to deformation and oxidation at temperatures up to red heat.

HAUGHTON'S PATENT METALLIC PACKING CO., LTD.—There were on view a number of types of apparatus made of their acid-resisting non-corrosive silicon-iron alloy, "Ironac," including pans, taps, cocks, etc. Diagrams were shown of "Ironac" plants for use in various phases of nitric acid work, such as nitric acid condensation. Among other exhibits were various spray nozzles for atomisers, for spraying water or acids, and a regular metal electrically-driven sulphuric acid pump.

ANOTHER corrosion-resisting alloy on view was Ferry metal, displayed at the joint stand of the Mond Nickel Co., Ltd., and Henry Wiggin and Co., Ltd. Further details of this are given below in the description of the stand.

Other Corrosion-Resisting Materials

Two exhibitors showed corrosion-resisting plant consisting of enamelled iron.

THE CANNON IRON FOUNDRIES, LTD.—A comprehensive exhibit of cast iron enamelled plant of this type was shown, including pans, steam-jacketed pans, cast iron receivers, a large steam-jacketed mixing still of 25 gallons capacity, and a large variety of laboratory apparatus, such as water baths, evaporating basins, beakers, etc. An exhibit of special and significant interest was a pre-heater for an ammonia oxidation plant.

T. AND C. CLARK AND CO., LTD.—Here also was a display of this type. They showed stills, a mixer, condensers and receivers, sulphonators, extraction plant, and the usual variety of laboratory requisites.

Acid-Resisting Concrete

PRODORITE, LTD.—The display of Prodorite may conveniently be discussed at this point. Prodorite is a substance prepared from hard pitch and mineral matter, which may be all siliceous (for resisting acid), or limestone aggregate and sand. The material may be used for covering floors, for pipes, roofs, cellars, roads, tank linings, etc. A very large tank was among the exhibits. The resistance of the material to boiling water was demonstrated, and charts were shown of the results of mechanical tests, which indicate greater strength than the best cement concrete.

General Plant

BENNETT, SONS AND SHEARS, LTD.—This company displayed copper apparatus of various types, including a 20-gallon steam-jacketed vacuum still, having a free steam coil inside, a similar 1-gallon still, an autoclave, solvent extraction apparatus, large and small; pressure sterilisers; and a Shears' patent mulser, for perfecting emulsions made in any form of emulsifier.

THE ALUMINIUM PLANT AND VESSEL CO., LTD.—Included in this exhibit were a large aluminium still, coils, a patent heat-exchanger, copper surface condensers, a welded copper varnish pot, a welded stainless steel steam-jacketed pan, a continuous filter, a Guelph wood cask with a welded aluminium inner casing, etc.

BROWN AND SONS (ALEMBIC WORKS), LTD., showed a series of copper stills, gas, steam, and oil-heated, drying ovens, and apparatus for distilled water installations.

BROOM AND WADE, LTD., had a display of air compressors, vacuum pumps, pneumatic tools, etc.

S. H. JOHNSON AND CO., LTD.—Here were shown filter presses of various kinds, ranging from those used industrially to those used in the laboratory; vortex mixers; wet and dry vacuum pumps, single and double stage; and other apparatus.

WILLIAM DOUGLAS AND SONS, LTD.—Various types of the Douglas concentric positive action rotary pump, for acids, chemicals, coal tar, benzol, cold brine, etc., were exhibited.

INTERNATIONAL COMBUSTION, LTD.—A working model of a Raymond pulveriser (one-fifth full size) complete with air separation system was shown. Demonstrations were given showing grinding, separating, and conveying all done in one operation. Small models of Hardinge conical mills were also on view.

THE LEEDS AND BRADFORD BOILER CO., LTD.—This company exhibited tar distilling and dehydrating plants, ammonia stills, benzol stills, pressure vessels, etc.

A New Colloid Mill

BAKER PERKINS, LTD.—The "Webb" colloid mill, exhibited at this stand, is said to be based on a principle not used hitherto. Within the spherical body are rotatably mounted arms and beaters, circular in section and having a circular formation. The material is subjected to rotation at varying speeds according to the speed of each beater, setting up a relative motion between its contiguous films or layers. The material is subjected to intense hydraulic shearing and other actions. Another exhibit by the company was a copper-lined machine for breaking down cotton linters previous to use in the preparation of cellulose acetate silk. Other mixers, etc., were shown, including one for food products, having a bronze trough, and a four-speed beater for diluting paint.

FAIRFIELD-HOWDEN RUTHS STEAM ACCUMULATORS, LTD.—Here was demonstrated a steam accumulator sold to the chemical works of a northern town corporation. Diagrams were shown of the manner in which uniformity of firing of the boilers and economy are achieved by the use of steam accumulators.

A Small Water Softener

THE KESTNER EVAPORATING AND ENGINEERING CO., LTD.—Several exhibits were shown, though considerations of space exercised a cramping effect. The exhibits included a heat exchanger, a battery of leaches, patent elevators for acids, fans for corrosive gases, and a patent film heat drier. A further exhibit of very great interest was a small zeolite water softener for household and laboratory use. It is practically fool-proof. Its value domestically is obvious, and it would need, for household purposes, regeneration only about once a week. It seems to have interesting applications in providing water for distillation in the laboratory, and may lead to economy in gas.

Precision Apparatus

BRITISH ARCA REGULATORS, LTD.—A composite apparatus was shown to illustrate four of the many regulators made by the company; the exhibit demonstrated a high pressure regulator, a low pressure regulator, a humidity regulator for maintaining constant relative percentage humidity in drying rooms, etc., and a temperature regulator for application to all temperature control problems. A single-seated valve, opened for inspection, was also on view.

NEGRETTI AND ZAMBRA.—Recording apparatus of many kinds was shown, including mercury in steel indicating and recording distance thermometers, dial depth gauges for tanks, electrical resistance thermometers, pyrometers, hygrometers, etc.

Mixing and Grinding Plant

THOMAS BROADBENT AND SONS, LTD.—Centrifugal machines and hydro extractors of various kinds were displayed. The main exhibit was a 36-in. motor-driven centrifugal for drying crystalline and granular products. A number of small models were demonstrated in order to make clear the nature of various other types of machine, for separation, decantation, precipitation, degreasing, etc.

BRINJES AND GOODWIN, LTD.—Machines for mixing, grinding, filtering, evaporating, etc., were shown. Among the exhibits were a steam-jacketed tilting mixer, a 24-in. horizontal mixer, an "All Clear" mixer, a 3-roll Helix mill, a small laboratory model with porphyry rolls, and a patent two-power ball-bearing diamond surface filter press. The mixers can be made in any metal.

See also BAKER PERKINS, LTD., above.

Hydrogen and Oxygen Production

THE INTERNATIONAL ELECTROLYTIC PLANT CO., LTD.—Knowles patent electrolytic cells for producing oxygen and hydrogen were exhibited, being part of a plant now being erected abroad, which will, it is believed, be the largest electrolytic hydrogen and oxygen producing plant in the world. The cells were complete with feed and washer tanks. Each cell is arranged for a working current of 7,500 amps. Each cell produces 121 cubic ft. of hydrogen and 60·5 cubic ft. of oxygen per hour.

Calder-Fox High Speed Scrubber

CHANCE AND HUNT, LTD.—At this stand the Calder-Fox high-speed scrubber, for the removal of mists from gases, was displayed. The example shown was a 30-in. scrubber, built of lead, and used for sulphuric acid mists. The gases, laden with mist, are passed through perforated plates. The speed and impact cause the particles of mist to coalesce; the coalesced particles fall into the bottom of the scrubber, whence the condensate is drawn off. Exhibits were shown illustrating the economy in space and superiority of results obtained by this scrubber as compared with those obtained by other forms.

Metals and Metallic Products

THE MOND NICKEL CO., LTD., and HENRY WIGGIN AND CO., LTD.—These two associated companies, sharing a stand, showed the production of nickel and by-products on the one hand, and the utilisation of nickel in plant and apparatus on the other. A diagram illustrated the preparation of nickel from Sudbury ore. Among the products shown were Ferry alloy, a nickel alloy which is resistant to corrosion. "Brightray" wire, a nichrome product, is a resistance wire, safe up to about 1,000° C., which is used for electric furnaces. "Glowray," a lower grade wire of a similar type, may be used up to 850°. In addition there were shown cupro-nickel, Invar and Ferrozoid (nickel steels), nickel anodes (the Beach type, which sinks entirely into the electrolytic vat), and a variety of nickel crucibles and other nickel laboratory ware.

BROUGHTON COPPER CO., LTD.—Tubes and sheets of various metals were shown—*e.g.*, tubes of copper, cupro-nickel, brass, tin, arsenical copper, and aluminium; and sheets of hot and cold rolled copper, aluminium-bronze, cupro-nickel, etc. A feature was the display of Duplex tubes, consisting of tubes of one metal drawn over another, such as seamless copper tubes drawn over aluminium and other metals.

THE HYDRONYL SYNDICATE, LTD.—This exhibit consisted of Lessing contact rings of various metals for use in packing scrubbers, absorption and reaction towers, distilling columns, heat exchangers, reaction vessels and similar plant. The rings consist of uniformly shaped cylinders of sheet metal, having a central partition which adds to the contact surface and acts as an additional baffle.

ALLEN-LIVERSIDGE, LTD.—This company exhibited the A-L oxy-acetylene lead-burning equipment for chemical apparatus manufacturers. Demonstrations were given of lead welding and all types of lead burning by this method. Other exhibits included various oxy-acetylene burners and similar apparatus for laboratory use.

GREY AND MARTEN, LTD.—Here various lead, tin and other exhibits were shown, including a condensing coil of pure drawn tin pipe, and a wrought iron tube lined with lead. Other exhibits showed methods of burning joints, etc.

Silica Ware

THE THERMAL SYNDICATE, LTD.—There was an extensive exhibit of fused silica ware by this company. Apart from the exhibits there were four very large hollow silica pillars supporting the stand. The exhibits included a column for hydrochloric and absorption, vessels and coils for nitric and sulphuric acid concentration, a great variety of large basins and tubes, besides many samples of small laboratory ware. One special tube included a section of clear, transparent silica, thus permitting of the observation of reactions occurring in the tube.

Miscellaneous

INDUSTRIAL WASTE ELIMINATORS, LTD.—Various types of the "Iwel" patent dry process plant for fat, bone and offal rendering, the turbine-centrifugal fat and oil extractor, grinding and screening equipment, etc., were exhibited. This exhibit illustrated the dry process for rendering all classes of edible and technical fats, among other things, with the production of superior fats and high-grade concentrated animal feeding stuffs.

CAPE ASBESTOS CO., LTD.—Caposite, a new asbestos, was exhibited. It makes up into cloths suitable for the filtration of acids and corrosive liquors. It resists the action of sulphuric, hydrochloric and nitric acids. There were also shown white asbestos cloth for the diaphragms of electrolytic cells (alkaline) used for producing oxygen and hydrogen, and asbestos packing for cocks, pumps, glands, etc.

"The Chemical Age"

At THE CHEMICAL AGE stand, in addition to copies of the journal, were exhibited a large number of scientific and technical books published by Ernest Benn, Ltd. *Discovery* and other of the publications of Benn Bros., Ltd., were also on view.

Exhibition at the Institute

At the exhibition held at the Institute this week the following exhibits were shown:—Doulton and Co., Ltd., laboratory porcelain; British Drug Houses, chemicals; Evans Adlard and Co., Ltd., filtering paper; Standley Belcher and Mason, Ltd., micro-chemical and graduated glass apparatus; The Thermal Syndicate, Ltd., "Vitreosil" pure fused quartz laboratory ware and transparent pure fused quartz glass apparatus; Townson and Mercer, Ltd., special apparatus; Harrington Brothers, Ltd., inorganic and organic chemicals; W. and R. Balston, Ltd., Whatman filter papers, fat extraction thimbles, etc.; Baird and Tatlock (London), Ltd., chemical and industrial laboratory apparatus; Wood Brothers' Glass Company, Ltd., laboratory glassware; The Stream-Line Filter Co., Ltd., filtration of colloidal precipitates, laboratory filters; John J. Griffin and Sons, Ltd., bomb calorimeter, oil testing apparatus, spectrometer, cement testing apparatus, etc.; Duroglass, Ltd., chemical glass apparatus; Brown and Son (Alembic Works), Ltd., autoclaves, stills, ovens, and general chemical apparatus; W. and J. George, Ltd., scientific apparatus; South Metropolitan Gas Company, gas circulating apparatus; S. Bornett and Co., Ltd., the "Eta" pressure filter (laboratory type), filtering through porous plates of fire-clay, silica, or carbon, lumina spectacles, enabling accurate colour estimations to be made by ordinary electric light, and Star fillings for fractionating columns; Hopkin and Williams, Ltd., fine chemicals and reagents recently added to the firm's list; John Moncrieff, Ltd., Monax laboratory glassware, etc.; The Worcester Royal Porcelain Co., Ltd., laboratory porcelain; Boots Pure Drug Company, Ltd., rare synthetic organic products; A. Gallenkamp and Co., Ltd., laboratory apparatus, etc.; The Scientific Glassblowing Co., scientific glass apparatus; Plowden and Thompson, Ltd., glass and laboratory apparatus, Pyrex laboratory ware; Ozonair, Ltd., ozone apparatus; L. Oertling, Ltd., balances and weights; H. K. Lewis and Co., books; R. and J. Beck, Ltd., microscopes, spectroscopes, and polarimeters; Adam Hilger, Ltd., refractometers, polarimeters, and spectroscopes; W. Watson and Sons, Ltd., microscopes, etc.; The Royal Sovereign Pencil Co., Ltd., chinagraph, dermatograph, and ordinary pencils.

Contraction of Aluminium Alloys

ACCORDING to the *Giesserei Zeitung*, experiments have been made on the effect of copper, iron, and magnesium on the contraction of aluminium alloys. Under analogous conditions contraction decreased with rising copper-content, and similarly for iron when chill moulds were used. Magnesium was shown to have a similar effect. The tests were made with bars cast at 700° to 900° C., and in copper additions only the bars poured at the latter temperature with a copper-content of 12 per cent. to 14 per cent. showed higher contraction. As regards results of a copper-iron addition, when pouring was done into sand moulds at 700° C. the iron had practically no effect, but when using metal moulds the tendency was to lessen contraction. The addition of 8 per cent. magnesium reduces the contraction of a bar with a cross-section of 1·5 sq. cm. poured at 700°, the said reduction being from 1·68 per cent. to 1·23 per cent. Even with 0·5 per cent. magnesium, under identical conditions, the reduction was from 1·42 per cent. down to 1·30 per cent.

British Colour Users and Dyestuffs Policy

A Friendly but Critical Attitude

THE annual report of the Colour Users' Association, to be submitted at the annual meeting in Manchester on Tuesday next, combines with a friendly attitude towards the British dyestuffs industry an alert watch over the interests of dyestuff users, particularly in the matter of prices. During the past year considerable work has been done in keeping up to date the list of non-contentious colours used by the Licensing Committee to facilitate granting of licences for such dyestuffs, and in considering and agreeing upon the standard and comparative strengths of various German and British colours. The Committee has under consideration the position likely to arise on the expiry of the Safeguarding of Industries Act in August, and is taking steps to see that the views of colour users shall be placed before the Government in the event of the continuance of the Act.

"Very Unsatisfactory Position"

As a result of protracted negotiations and discussions with officials of the Board of Trade and the Association of British Chemical Manufacturers, the Dyestuffs Industry Development Committee has agreed to furnish the Statistics Committee with statements of licences granted and dyestuffs imported, subject to certain conditions regarding publication. With regard to the statistics of British production, the report states :—

"Up to the present, notwithstanding the intervention of the Development Committee, the British makers absolutely refuse to furnish any statistics regarding production other than those published in the statement issued by the Board of Trade in 1925. This is felt to be a very unsatisfactory position, and the Association's representatives on the Development Committee are continuing to press for full and adequate information to be supplied. The Committee has also done a great deal of work in examining and classifying the statistics available of the dyestuffs position in other countries, and in collating information from various sources. In this connection the Committee has been considering at length the question of the position of colour consumers abroad."

Licences and Prices

The majority of applications for licences have again been dealt with expeditiously, but the report states :—

"Some difficulty arose on the question of granting licences for the importation of foreign colours on price grounds, where both the foreign product and British equivalent had been put on the market since the War—there being no pre-war price upon which the factor method could be applied. Your representatives on the Dyestuffs Advisory Licensing Committee took up the matter, and it was agreed that in such cases the foreign price ruling three months prior to the introduction of the British colour should be, for a period of six months, the price at which the British makers must sell if they wished to secure the business and prevent licences being granted on price grounds. After the six months stabilised period had elapsed the British makers were to be allowed a percentage advantage (to be fixed by the Dyestuffs Advisory Licensing Committee in each case) over the ruling foreign price. For some time it has been an agreed practice of the Dyestuffs Advisory Licensing Committee to grant licences for quantities of Swiss colours for which there was an equivalent colour in Reparation stock, provided the applicant purchased an equal quantity at a corresponding price of the Reparation colour. It was felt that this principle should be applied in all cases, whether the colour to be imported was Swiss or other foreign manufacture, and the Dyestuffs Advisory Licensing Committee agreed to accept this extension."

Alizarine Prices

For some considerable time the Council has been giving serious attention to the question of the price of alizarine, and strong representations have been made to the Dyestuffs Advisory Licensing Committee with a view to obtaining a reduction in the British price, or, alternatively, a licence to import. At present the matter has been referred to the Chairman of the Licensing Committee (Sir Thomas Robinson) for investigation and report, and it is hoped that an agreement will be reached. Pending further developments, a slight reduction in the British price has been obtained. The Association's representatives will continue to press the matter strongly, and, failing a satisfactory outcome, a deputation has been appointed to bring the consumers' case before the Board of Trade.

Strict observance of the procedure to be followed in making applications for licences, either on the grounds of quality or of difference in price, has led to the smoother working of the licensing machinery, and the prompt reporting of difficulties to the Secretary has enabled many grievances to be remedied.

German Patent Complications

The question of Napthol AS. and Analogous Products, the report states, has been the subject of prolonged negotiations between the Association, the Licensing Committee, and the Board of Trade; the representatives of the Association have also been in touch with the British and German makers. During the War the Government seized the German patents for the manufacture of these products and granted licences to the British makers. The British manufacturers produced the colours, and the Licensing Committee refused licences for the German products and referred applicants to the British makers. In the meanwhile members of the Association who used the British equivalents were threatened with litigation by the German companies who held patent rights protecting the use of their inventions. The position was, therefore, that the Licensing Committee were refusing to grant licences for the foreign product and thus forcing the users to break the law; consequently the users wished the Licensing Committee to secure protection for them, or otherwise grant licences for the various products. A sub-committee—the Patents Committee—was appointed to go fully into the matter, and several interviews took place with officials of the Board of Trade, the Patents Office and representatives of the British manufacturers. As a result of these efforts negotiations were opened with the I.G. by the Licensing Committee and the Board of Trade, and eventually an agreement was arrived at between the British makers and the I.G., with the concurrence of the Board of Trade, under which users were freed from liability for the use of the British equivalents, and the importation of certain quantities of the foreign products would be permitted.

Indigo Buying Group

In the last annual report reference was made to the dissatisfaction felt by users with the price of indigo. The Council, after investigating the matter very fully with a view to taking action to relieve consumers, was successful, with other organisations, in obtaining a substantial reduction in price and in organising a scheme under which users could combine for the purpose of group buying, so as to obtain the maximum benefit of the rebates granted by the British makers on large purchases. A Colour Users' Association Buying Group was formed, open to all members of the Association who were not connected with any other indigo buying group, and has continued in operation satisfactorily throughout the year.

At the last annual meeting the chairman (Mr. H. Sutcliffe Smith) referred to the two-and-a-half times factor and its effect on the general level of dyestuffs prices in this country. This subject has been referred to the consideration of the Statistics Committee, which has been investigating the position of colour users in this country as compared with that of users abroad. As a result of their deliberations the Council has appointed a deputation to visit the Continent to make a general survey of the whole dyestuffs situation as it affects consumers of colour in the various Continental countries, and a report thereon will be circulated to the members in due course. In connection with the reconstruction of the British Dyestuffs Corporation, the Council's attention has been engaged with those aspects of the question affecting the interests of colour users, and the Council has been in touch both with the Board of Trade and with the British Dyestuffs Corporation. Steps have been taken to see that the authorities were cognisant of the users' point of view.

The Pricing Committee, on which the Association is represented, will be glad to take up any instance in which the Reparation price is higher than that charged by agents if full details are forwarded to the secretary of the Association.

Industry and Trade Inquiry

Evidence by Sir Ernest Benn

GIVING evidence before the Committee on Industry and Trade on Wednesday, Sir Ernest Benn dealt with the differences between this country and America. He claimed that England was as well or better provided with scientific and mechanical knowledge and equipment, but the prevailing social and political ideas in the two countries differed so widely as to produce totally different commercial and industrial conditions. It was wrong to suppose that we wanted anything from America except some of her ideas on such subjects as work and machinery. If Britishers could develop the enthusiasm for production that was common in America the industrial supremacy of this country would be assured. America had other advantages which we lacked. There was a universal acceptance of the theory that private property was right. The Americans looked at industry from the point of view of the consumer, and by studying him and giving good service, found, as indeed must be the case, that the producer was adequately rewarded. Trade and industry in America were rendered much easier than here by the almost complete absence of the risk of legislation.

Deadening Effects of Public Control

Dealing with the functions of the State in regard to industry and trade, Sir Ernest said the habit of relying upon public authority had developed in this country so considerably as to weaken individual initiative and reduce the volume of trade. The standard of living in Great Britain would be higher to-day than the standard of living in the United States if we had the same reliance upon the individual and the same freedom for him to function. Those trades where Government interference was most active had gone from bad to worse, as was shown by the present condition of mining and housing—two big industries which for nearly half a century had been subjected to constant meddling on the part of politicians. Those industries, on the other hand, such as food and clothing, which had been left free to function in their own way, had never failed to achieve ever greater prosperity and render ever greater service to the community.

In dealing with the burden of taxation, Sir Ernest claimed that there were two related but distinct ideas at the back of British taxation on its present intolerable scale—firstly, the false belief that the State could make good use of money; and, secondly, the desire to punish success. Whereas in the days of Gladstone public expenditure never exceeded £9 per annum per family, we were now spending through public bodies £3 per week per family. Sir Ernest claimed that Government authorities and public institutions were necessarily, from their nature, the most inefficient and expensive agencies for performing any given function. He further argued that taxation on its present scale turned potential capital into income, and thus we were committing the worst of financial crimes and laying up increasing trouble for the future.

Dating of Patents

Board of Trade Committee Appointed

A COMMITTEE has been appointed by the Board of Trade to consider whether any, and, if so, what change is desirable in the practice of (*a*) dating patents, applied for under Section 91 of the Patents Acts, as of the date of application in the foreign state; and (*b*) dating patents granted upon ordinary applications as of the date of application in the United Kingdom.

The main question which the Committee has to examine is whether this practice should be continued or whether patents granted upon applications made under Section 91 should bear some later date, such as the date of application in this country, or the date of grant of the patent, while still giving the applicant the priority as regards inventorship which must be given to him under international arrangements.

The Committee will be glad to receive suggestions or representations upon the matters covered by their terms of reference. In considering the questions involved, the Committee desires that due regard should be paid to all the interests involved, *i.e.*, the interests of inventors, manufacturers, consumers and the public generally. Communications should be addressed to the Secretary to the Committee, Mr. B. G. Crewe, The Patent Office, 25, Southampton Buildings, London, W.C.2.

Chemical Matters in Parliament

Dyestuffs Imports and Licences, 1922-25

Replying to Mr. Harris (House of Commons, July 6), Sir P. Cunliffe-Lister gave figures for the import into the United Kingdom, during each of the years 1922 to 1925, of dyestuffs and intermediates. The following particulars comprise importations on Reparation Account:—Finished dyestuffs obtained from coal tar (alizarine, synthetic indigo, etc.), 1922, 2,880 tons (£1,326,174); 1923, 2,808 tons (£1,004,482); 1924, 3,541 tons (£1,335,493); 1925, 1,981 tons (£646,903). Intermediate coal tar products imported under the same heading as above were:—1922, 2 tons (£917); 1923, 68 tons (£17,062); 1924, 32 tons (£8,587); 1925, 66 tons (£12,705). Natural indigo imports under the same heading were:—1922, 65 tons (£45,041); 1923, 37 tons (£22,249); 1924, 42 tons (£21,270); 1925, 11 tons, (£6,426). With regard to products to which the Dyestuffs (Import Regulations) Act, 1920, relates, the following table gives particulars of the licences issued under that Act (these particulars do not include importations on reparation account):—

Licences granted under the Dyestuffs (Import Regulations) Act, 1920, for the Importation of Dyestuffs, Colours and Colouring Matters, and Organic Intermediate Products used in the Manufacture of such Dyestuffs, Colours and Colouring Matters.

Year.	Number of licences granted.	Total value licensed.	Total quantity licensed.	Total Amount of Licence Fees charged.
		£	lbs.	£ s. d.
1922	4,975	1,103,819	3,234,893	3,341 12 6
1923	4,341	989,537	3,691,440	3,543 5 0
1924	4,332	770,943	3,036,234	2,867 10 0
1925	4,879	651,534	3,399,054	2,270 7 6

Opium Imports from India

Sir H. Barnston (House of Commons, July 19), replying to Mr. Ponsonby, said that 116,000 lb. of raw opium were imported into this country from India in 1925; 16,000 lb. were exported during the same year. The Indian opium retained in this country was used for the manufacture of morphine and other drugs and medicinal preparations.

Copper and Aluminium Quotations

Mr. Samuel (House of Commons, July 19), in answer to Mr. Hardie, said that during June, 1925, the closing quotations for electrolytic copper varied between £62 10s. and £64 5s. per ton, and during June, 1926, between £64 and £65 10s. per ton. English aluminium was quoted at £118 per ton during each of these months.

Ammonium Sulphate

Lieut.-Commander Kenworthy (House of Commons, July 20) asked the President of the Board of Trade what percentage of the ammonium sulphate produced in Great Britain in 1925 was produced as a by-product in gas works, etc., and what percentage was produced by synthetic methods?

Sir P. Cunliffe-Lister said he had not this information.

Hong Kong Opium Revenue

Mr. Amery (House of Commons, July 20) informed Mr. Ponsonby that the net revenue derived by the Government of Hong Kong from its opium monopoly in the years 1923, 1924 and 1925 amounted to $4,946,150, $4,459,756 and $2,567,670 respectively.

Big Sheffield Amalgamation

A COMPANY to be known as Darwins, Ltd., has been formed, with a nominal capital of £500,000, in order to amalgamate and take over the following allied businesses:—Darwin and Milner, Ltd., Sheffield; Sybry, Searls and Co., Ltd., Sheffield; Spartan Steel Co., Ltd., Sheffield; Nelson Tool Co., Ltd., Sheffield; Cobalt Magnet Steel Co., Ltd., Sheffield; Akrat Steel and Wire Mills Co., Ltd., Sheffield; Beeley Wood Steel Co., Ltd., Sheffield; Sheffield Annealing Works, Ltd., Sheffield; Hos-Syb Works, Ltd., Sheffield; Birks, Stevens and Son, Ltd., Sheffield; Darwin and Milner, Inc., Cleveland, Ohio, U.S.A.; Darwin and Milner, Ltd., Brussels; Neuenteichwerk, Lennep, Rhld.; the administration of which is centred in the recently acquired Fitzwilliam Works, Templeborough, Sheffield. The various sections of the business are continuing under the same management and trade marks, and manufacturing will also still be carried on at the Cannon Steel Works, Carlisle Street, Sheffield; Beeley Wood Forge, Sheffield, and Akrat Steel and Wire Mills, Sheffield.

From Week to Week

MR. J. H. QUASTEL, a student at the Imperial College of Science, has been awarded a D.Sc. (London) degree, for research work.

MR. A. CARTWRIGHT has been appointed a Director of Vickers, Ltd., and Mr. G. G. Sim has been appointed Secretary of the same firm.

THE BRITISH SUGAR BEET EXPERTS VISITING GERMANY have visited the laboratories of Hverning Brothers, at Wendel-Stein Castle.

LADY MOND has had jewellery to the value of over £5,000 stolen from Melchet Court, the Hampshire residence of Sir Alfred and Lady Mond.

MR. HARRY STEVENSON (deputy-chairman since 1917) has been elected chairman of Allen-Liversidge, Ltd., in succession to the late Mr. C. S. Gillman.

MR. RUDOPLH MUSPRATT, son of Sir Max and Lady Muspratt, has taken his degree at Oxford. He took Honours (Second Class) in Chemistry and graduated B.Sc.

AT WOOLWICH ARSENAL a fire broke out in a coal dust and gas producing plant near the shell foundry on Saturday, July 17, but was extinguished in a few minutes.

DR. FREDERICK ALFRED MASON is recommended for appointment as lecturer in tinctorial chemistry and dyestuffs in the Manchester Municipal College of Technology, at a salary of £700 per annum.

SPACE IN THE BRITISH INDUSTRIES FAIR can be guaranteed only to those applying by the end of next week, and the Department of Overseas Trade has circularised 10,000 manufacturers to this effect.

PHILIP ARTHUR SMITH, a technical chemist, of Wentworth, was charged before the Sheffield West Riding Magistrates on Tuesday, July 13, with having driven a motor car dangerously at Chapeltown. He was fined £2 and costs.

CHILEAN SHIPMENTS of nitrate for the first fortnight of July amounted to 32,000 tons, according to Messrs. Aikman (London), against 175,000 tons in the first fortnight of July, 1925, the shipments for Europe and Egypt being 8,000 tons, against 102,000 tons.

£50 WORTH OF PERFUMERY, contained on four shelves in a Guernsey chemist's shop, was thrown upon the floor through excessive vibration caused by a passing motor vehicle, and it is estimated that at least one quarter of this was lost through percolation to the floor.

DR. ERIC C. PICKERING, B.Sc., A.I.C., Lecturer in Chemistry at the Royal Technical College, Glasgow, has been appointed Head of the Chemistry Department, Borough Polytechnic Institute, in succession to Mr. H. Lambourne, M.A., M.Sc., F.I.C., now Head of the School of Chemistry, The Polytechnic, Regent Street.

THE DIRECTORS OF BRITISH VISADA, LTD. opened their Littleborough mill on Thursday, July 15, for the production of artificial silk by the viscose process. When fully running the mill is expected to find employment for about 300 women and 200 men, and to have a weekly output of 27,500 lb. before the end of the year.

LETTERS PATENT under the seal of the British Patent Office could not apply to the Free State, according to a judgment delivered by Mr. Justice Meredith in the Dublin High Court on Friday, July 16, and no patent issued before December, 1922, is valid in the Irish Free State. The case was an action by the British Thomson-Houston Co., Ltd., against Litton and Co.

MR. EDWARD WELDING, a charge hand at the High Speed Alloys, Ltd., was invested by the King with the King Edward Medal on Tuesday, July 13. Last October a youth named Harper, employed in the works, fell into a large vat containing vanadic acid. The contents of the vat formed a gelatinous mass at a scalding temperature, and Harper, though his head was clear of the acid, was quickly sinking and would have been submerged in a few seconds had not Welding entered the vat and saved him.

THE NEGOTIATIONS between the German I.G. and the Standard Oil Company aiming at an agreement concerning the Bergius process for producing synthetic benzine are confirmed by the I.G. administration. The object of the discussions is said to have been the question of eliminating from certain markets of the Standard Oil Company the possibility of competition from synthetic benzine. It is believed that this product can be put on the market at from 2d. to 2¼d. per kilo. after the necessary plant has been completed. The administration of the I.G. states that a fundamental basis for an agreement has been found, but that no definite details can be communicated.

THE BRITISH FOOD MANUFACTURERS' RESEARCH ASSOCIATION has been granted a licence, under Section 20 of the Companies' (Consolidation) Act 1908, by the Board of Trade. The Association has been approved by the Department of Scientific and Industrial Research as complying with the conditions laid down in the Government Scheme for the encouragement of industrial research. The Secretary of the Association is Mr. R. M. Leonard, 22, Buckingham Gate, London, S.W.1. The investigations of the Association will be conducted in close co-operation with those of the British Association of Research for the Cocoa, Chocolate, Sugar, Confectionery, and Jam Trades.

THE CHEMICAL EMPLOYERS' FEDERATION (Yorkshire Section have nominated Mr. Chas. K. Crosland to represent them on Huddersfield Employment Committee.

THE LIBRARY of the Chemical Society will be closed for stock-taking from Monday, August 2, until Saturday, August 14, inclusive, and will close each evening at 5 o'clock from August 16 to September 11.

THE DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH has issued, price 1s. 3d., Fuel Research Technical Paper No. 15, on "Carbonisation of Coal in Continuous Vertical Retorts—Holmside (Durham) Coal with experiments on the Production of Coal Gas of High Calorific Value."

LONDON COUNTY COUNCIL EDUCATION COMMITTEE have been recommended to award Robert Blair Fellowships valued at £450 to Mr. Malcolm D. Bone, of St. Albans, and Mr. Eric W. Fell, of Ulverston, Lancs. Both have decided to utilise their Fellowships in studying modern processes of steel manufacture.

DR. R. W. MCKENNA, of Liverpool University, in a case heard at Liverpool on Wednesday, said that the use of paraphenylenediamine for hair dyeing or dyeing furs should be suppressed, as it was a drug which produced skin diseases. The case was one in which the wife of a Liverpool Corporation employee was awarded £100 damages against a furrier of Liverpool for damages for skin disease caused by dye from a fur collar of a coat she had bought from the defendant.

RECENT WILLS INCLUDE: Mr. Arthur Sheard, of Heckmondwike, Yorks, dyer, £12,945.—Mr. Adolphe Saalfeld, of Kew, Surrey, chairman of Sparks, White and Co., Ltd., of London, distillers' chemists, £46,902.—Dr. Arthur Robertson Cushny, F.R.S., M.D., LL.D., Professor of Materia Medica and Pharmacology in the University of Edinburgh, £22,140.—Mr. Robert Thatcher, of Wimbledon Park, senior partner of Epps, Thatcher and Co., chemists, of Jermyn Street, London, £3,719.

THE FOURTH ANNUAL REPORT of the Safety in Mines Research Board, for 1926, has just been published, and is mainly devoted to accounts of the progress of the numerous researches which are being carried out, either directly under the Board, or committees of the Board, or at universities and other centres. The Board has now two experimental stations, at Sheffield and Buxton. The scientific and technical staff numbers about fifty. The total annual expenditure on these researches approaches £50,000 a year, and is mainly defrayed out of the Miners' Welfare Fund.

THE FUSION OF THE I.G. FARBENINDUSTRIE and the Koeln-Rottweil Co., reported last week, is regarded in Berlin as being of world-wide importance, since it foreshadows a world competition such as has not been witnessed in industrial history. It is also believed that this transaction is but the beginning of a coming world cartelisation of rayon production, which, when completed, will automatically comprise all the important and leading rayon fibre plants in Germany, Italy, Great Britain, and the United States. The present rayon trust is backed by a capital of 2,000,000,000 marks.

THE NATIONAL FEDERATION OF IRON AND STEEL MANUFACTURERS have issued figures which show the paralysis in the iron and steel trade since the stoppage in the coal industry. On the eve of the stoppage 147 blast furnaces were in operation. These were reduced to 23 by the end of May, and still further reduced to only 11 by the end of June. Production of pig iron, which amounted to 539,100 tons in April, fell to 88,800 tons in May, and to 41,800 tons in June. The output of steel ingots and castings in March last was the highest for many a month at 784,100 tons. April saw a reduction to 661,000 tons, while in May the production was only 45,700 tons, and in June 32,800 tons.

APPLICATIONS ARE INVITED for the following appointments: Lectureship in Physical Chemistry in University College, Dundee, as from October 1. £500. The Secretary and Registrar. August 16.—Research scholarships tenable in the Technical College, Huddersfield. Joseph Blamires Research Scholarship in Colour Chemistry; and the Drapers' Company Research Scholarship tenable in the Dyeing Department. Value £100 each, with remission of fees. The Principal.—Temporary assistant chemists, B.Sc. Second Class Honours or equivalent. Men £160—£10—£220, women £140—£10—£180, both plus Civil Service bonus. The Government Chemist, Clement's Inn Passage, London, W.C.2, July 31.—Chemical pathologist and lecturer on chemical pathology in the St. Bartholomew's Hospital and Medical College. The Dean of the Medical College, or Thomas Haynes, Clerk to the Governors. August 16.

Obituary

MR. MONTAGU G. SMITH, President of the Drug and Chemical Union. He had been associated with the trade all his life and was dispenser at Lewisham Hospital.

MR. FREDERICK HARRISON GLEW, aged 68, of Clapham, London. A chemist and radiographer, he was awarded the Paris Medal for Radiography in 1909, and served throughout the war as radium expert to the Ministry of Munitions. He was a member of the Royal Institution and of the Röntgen, Optical, and Pharmaceutical Societies and a Fellow of the Institute of Physics.

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The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each

Abstracts of Complete Specifications

253,584. DYESTUFFS AND DYEING OF ACETYL SILK. Scottish Dyes, Ltd., E. G. Beckett, J. Thomas, and R. Tonkin, Murrell Hill Works, Carlisle. Application date, March 16, 1925. Addition to 231,206.

Specification 231,206 (see THE CHEMICAL AGE, Vol. XII, p. 438) describes the production of dyestuffs by the nitration of a di-phthal-imido-anthraquinone followed by simultaneous or separate hydrolysis and treatment by an alkaline sulphide. It has now been found that the alkaline sulphide can be replaced by the sulphide of an alkaline earth metal, particularly by calcium hydrogen sulphide.

253,659. COLOURING MATTERS, PRODUCTION OF. J. Y. Johnson, London. From Badische Anilin and Soda Fabrik, Ludwigshafen-on-Rhine, Germany. International Convention date, April 16, 1925.

Chromium derivatives are obtained in water-soluble form from direct colouring matters which contain groups enabling them to be chromed, especially from azo dyestuffs containing two radicles of an ortho-hydroxy-carboxylic acid. It is not necessary to prepare the chromium compounds of the dyestuff, but only to mix the dyestuff with a soluble chromium oxide salt, and the dyeings obtained are of greater fastness than those obtained with the dye alone or chrome mordanted cotton or with after chroming. In an example, the direct azo dyestuff made from 4 : 4^1-diamino-stilbene-2 : 2^1-disulphonic acid and two molecular proportions of salicylic acid are dissolved in water and boiled with sodium acetate and a chromium salt solution such as that made from chromium formate six molecular parts, chromium fluoride four molecular parts, and chromium sulphate one molecular part. The solution is filtered and the dyestuff salted out. The dyeings may be effected either in a hot bath or in the cold, and in the latter case an after-treatment with an alkaline agent may be employed.

253,763. MONOAZO DYESTUFFS OR INTERMEDIATE COMPOUNDS, MANUFACTURE OF—FOR THE MANUFACTURE OF DIS-AZO OR POLYAZO DYESTUFFS. A. G. Bloxam, London. From Chemische Fabrik Griesheim-Elektron, Frankfort-on-Main, Germany. Application date, September 23, 1925.

These monoazo compounds are made by combining a diazo compound of a mono-amine of the diphenyl series with a sulpho acid of a 1-aryl-5-pyrazolone or with a naphthol-sulphonic acid or amino-naphthol sulphonic acid. In an example, amino-dichloro-diphenyl is diazotised, and the solution run into a solution of *p*-sulpho-*o*-chlorophenyl-methyl-pyrazolone in caustic soda solution. The dyestuff gives yellow shades on wool. Nitro-substituted monoamines of the diphenyl series or acetylamino- or other substituted amino bodies of such monoamines or sulphonated bodies of either of these classes may be used.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention : 232,265 (H. Pereira), relating to perylene dyes, see Vol. XII, p. 641 ; 232,581 (Austral Pigments, Ltd.), relating to manufacture of ferric oxide, see Vol. XII, p. 641 ; 235,862 (Soc. of Chemical Industry in Basle), relating to dyestuffs, see Vol. XIII, p. 202 ; 235,888 (American Rubber Co.), relating to treatment of rubber latex, see Vol. XIII, p. 202 ; 238,909 (H. Hutz), relating to distillation of bituminous materials, see Vol. XIII, p. 477 ; 239,178 (F. J. Nellensteijn), relating to production of fatty acids from hydrocarbons, see Vol. XIII, p. 454 ; 241,232 (Rhenania Verein Chemischer Fabriken Akt.-Ges.), relating to alkali aluminates, see Vol. XIII, p. 269 ; 242,996 (F. Rothe and H. Brenek), relating to conversion of barium and strontium sulphates into other barium and strontium compounds, see Vol. XIV, p. 83 ; 244,747 (Soc. of Chemical Industry in Basle), relating to derivatives of pyridine-3-carboxylic acid, see Vol. XIV, p. 211 ; 251,266 (Soc. of Chemical Industry in Basle), relating to dyestuffs capable of being chromed, see Vol. XV, p. 59 ; 251,293 (Farbwerke vorm. Meister, Lucius, and Brüning), relating to indigoid dyestuffs containing sulphur, see Vol. XV, p. 59.

International Specifications not yet Accepted

251,651. SYNTHETIC DRUGS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, May 1, 1925.

Drugs for reducing blood-pressure are improved by combining with 5 per cent. of organic azides. In one example, a solution of *p*-iodoethoxybenzoic acid benzyl ester in acetone is mixed with pseudo-saccharine azide, and evaporated in vacuo.

251,652. SEPARATING AND TREATING HYDROCARBONS. Soc. Anon. d'Explosifs et de Produits Chimiques, 5, Rue du Général Foy, Paris. (Assignees of L. Blanchet, Seine, France.) International Convention date, May 1, 1925.

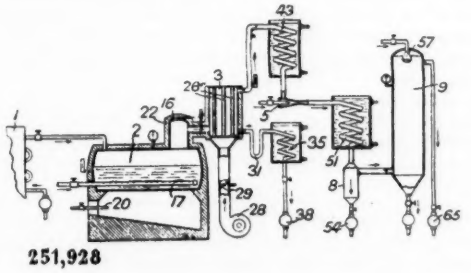
The crude gases obtained by cracking hydrocarbons are subjected to successively increasing pressures and decreasing temperatures, which separate in turn pentanes and amylenes, butanes and butylenes, and propane and propylene. Ethylene is then removed by treating with hypochlorous acid, and the residual paraffins are converted into monochlor derivatives by treating with chlorine. The pentane-amylene fraction is treated with hydrochloric acid and chlorine to form amyl chlorides, and then with sodium acetate to form acetates. The propylene may be absorbed in sulphuric acid and hydrolysed to obtain propyl alcohols. Alternatively the propylene and ethylene may be absorbed in hypochlorous acid, and the monochlor-hydrins separated by fractional distillation in vacuo.

251,666. SYNTHETIC DRUGS. H. Staudinger, 7, Hochmeisterstrasse, Freiburg, Germany. International Convention date, May 4, 1925. Addition to 232,206. (See THE CHEMICAL AGE, Vol. XII, p. 616.)

N-allyl-2 : 6-dimethyl-4-oxypiperidine is treated with benzoyl chloride to obtain the benzoyl ester.

251,928. DISTILLING HYDROCARBON OILS. Simplex Refining Co., 200, Bush Street, San Francisco. (Assignees of G. A. Kramer, 218, Grant Street, Concord, Cal., U.S.A.) International Convention date, May 9, 1925.

Petroleum products boiling above 600° F. are distilled in presence of steam and under pressure of 5 mm. of mercury to



251,928

obtain lubricating oils. Oil is passed through a tubular preheater 1 to a still 2 which is supplied with steam through a perforated pipe 17. The vapour passes from a heat-insulated dome 16 to a condenser 3 cooled by air from a pump 28, and the condensate passes through a cooling coil 35 to a pump 38. Uncondensed vapour passes through a water-cooled coil 43 to a steam-jet injector 5 which forces it into a condenser 51. The condensate passes through a separator 8, and steam and vapour pass to a condenser 9 under reduced pressure and provided with a water spray 57.

251,932. ALKALI ARSENATES, ANTIMONATES AND STANNATES. Vulcan Detinning Co., Sewaren, N.J., U.S.A. (Assignees of J. A. Lahey, West Avenue, Sewaren, N.J., U.S.A.) International Convention date, May 6, 1925.

A solution containing alkali arsenate and stannate which is obtained in refining metals or in the treatment of ores with caustic alkali, is concentrated and cooled to crystallise out the arsenate, and then further evaporated and cooled to crystallise the stannate. Any alkali antimonate is not dissolved when the original mixed salts are treated with water.

251,942. SULPHUR AND ALKALINE EARTH SULPHIDES. Salzwerk Heilbronn Akt.-Ges., T. Lichtenberger, and K. Flor, Heilbronn, Germany. International Convention date, May 8, 1925.

Alkaline earth sulphates are dissolved in molten sodium chloride, and coke added to obtain the sulphides. These are removed, and converted by treatment with vapour or acid into alkaline earth oxide or alkaline earthsalt and hydrogen sulphide. Sulphur is obtained from the latter.

251,968. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. (Assignees of Akt.-Ges. für Anilin Fabrikation, Treptow, Berlin.) International Convention date, May 7, 1925.

Ceruleins are heated with fuming sulphuric acid in presence of boric acid to obtain soluble sulphonic acids. The products from cerulein itself and from oxyhydroquinone-phthalein are described.

251,974. ANTHRAQUINONE-β-SULPHONIC ACID. Newport Co., Carrollville, Wis., U.S.A. (Assignees of I. Gubelmann, 1202, Fairview Avenue, South Milwaukee, and R. J. Goodrich, 522, Hawthorne Avenue, South Milwaukee, Wis., U.S.A.) International Convention date, May 9, 1925.

The mixture obtained by sulphonating anthraquinone is dissolved in water, filtered, and treated with concentrated ammonia solution. The solution is heated to 90° C., and cooled to crystallise out the ammonium salt of anthraquinone-β-sulphonic acid.

251,996. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, May 6, 1925.

A 3-methyl-4 : 5-dihalogenphenyl-1-thioglycollic acid, or such a thioglycollic acid as contains in the 2-position a further carboxy, $CONH_2$, or CN group, is treated by the usual methods to obtain the corresponding oxythionaphthene, which may be oxidised to the thioindigo or condensed with isatin, or dibromisatin chloride or anilide. The oxythionaphthene can be converted into a 2-derivative of 4-methyl-5 : 6-dihalogen-2 : 3-diketodihydro-thionaphthene and condensed. The preparation of 3-methyl-4 : 5-dichlorphenyl-1-thioglycollic acid is described.

251,997. CONDENSATION REACTIONS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, May 5, 1925.

Ring closure in aromatic compounds is effected by fluorsulphonic acid, which, in the preparation of thioindigo dyes from arylthioglycollic acids may at the same time oxidise the oxy-thionaphthene first formed. Examples are given.

252,029. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, May 11, 1925.

Bzl-α-naphthoyl-benzanthrone is fused with alcoholic potash to obtain a benzo-naphtho-pyrenequinone which dyes cotton from the vat in brown-orange shades. The starting material is obtained by condensing Bzl-benzanthrone carboxylic chloride with naphthalene in presence of aluminium chloride.

LATEST NOTIFICATIONS.

255,042. Process for the manufacture of anhydrous chloride of magnesium. Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges, et Camargue. July 8, 1925.

255,043. Process for the preparation of concentrated acetic acid from dilute aqueous or crude dilute pyroligneous acid. Dr. H. Suida. July 13, 1925.

255,047. Process for the preparation of concentrated acetic acid from dilute aqueous or crude dilute pyroligneous acid. Dr. H. Suida. July 13, 1925.

255,072. Manufacture of azo-dyestuffs. I. G. Farbenindustrie Akt.-Ges. July 7, 1925.

255,078. Processes of manufacturing chromates and manganates. Compagnie Générale des Produits Chimiques de Louvres, and P. Pipereaut. July 8, 1925.

255,086. Manufacture of mordant dyestuffs. Durand and Huguenin Akt.-Ges. July 13, 1925.

255,087. Manufacture of chromium-magnesium preparations suitable for tanning purposes. I. G. Farbenindustrie Akt.-Ges. July 10, 1925.

Specifications Accepted with Date of Application

235,547. Chlorine compounds of the next higher homologues of ethylene, Production of. T. Goldschmidt Akt.-Ges. June 10, 1924.

240,164. Crystallisation of solid substances in a coarse granular form from solutions. Aktieselskapet Krystal. September 17, 1924.

240,871. Synthetic manufacture of liquefied ammonia. G. Patart. October 6, 1924.

242,234. Silica gel. W. Carpmael. (*Chemische Fabrik auf Actien (vorm. E. Schering.)*) August 17, 1925.

243,736. Simple or mixed ethers of the fatty series, Continuous process for the manufacture of. Distilleries des Deux-Sévres. November 26, 1924.

245,421. Alumina, Reduction of. Metal Research Corporation. December 30, 1924.

249,099. Vat dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. March 10, 1925. Addition to 231,555.

250,598. 2 : 3-amino-naphthoic acid, Manufacture of. Soc. of Chemical Industry in Basle. April 8, 1925.

254,352. Lead oxide, Apparatus for the manufacture of. H. Waring. January 30, 1925.

254,382. Effecting intimate contact between liquids and gases, Apparatus for. Kirkham, Hulett, and Chandler, Ltd., S. Hersey, and F. W. Stokes. March 31, 1925.

254,389. Desulphurisation of zinc ores. W. J. Mellersh-Jackson. (*Soc. Anon. des Mines et Fonderies de Zinc de la Vieille-Montagne.*) April 1, 1925.

254,402. Naphthylamine sulpho acids, Manufacture of. E. F. Ehrhardt and R. M. Hereward. April 4, 1925.

254,476. Vat colouring matters, Process for the manufacture of. J. Y. Johnson. (*Badische Anilin and Soda Fabrik.*) June 2, 1925.

254,539. Radium and barium salts, Method of separating. I. Bashiloff. July 31, 1925.

254,551. Barium chloride and sulphur from barium sulphide, Production of. A. Jahl. July 3, 1925.

254,578. New insoluble azo dyestuffs, Production of. W. Carpmael (*Farbenfabriken vorm. F. Bayer and Co.*). October 29, 1925.

254,666. Platinum and palladium alloys, Manufacture of. M. G. Korsunsky. April 14, 1925.

254,667. Diamino-diaryl-urea or its derivatives, Production of. J. Y. Johnson. I.G. Farbenindustrie Akt.-Ges. May 21, 1926.

Applications for Patents

Bakelite Corporation and Marks, E. C. R. Moulded phenolic compositions, etc. 17,440. July 12.

Binz, A., and Rath, C. Production of organic arsenical compounds. 17,752. July 15. (Germany, July 22, '25.)

Boots Pure Drug Co., Ltd., and Marshall, J. Manufacture of alkyl resorcinols. 17,872. July 16.

British Dyestuffs Corporation, Ltd., and Chapman, E. Manufacture of adsorbent materials. 17,758. July 15.

Buchner, M. Manufacture of hydrofluoric acid. 17,657. July 14. (Germany, June 2, '24.)

Buchner, M. Process of producing hydroxides and carbonates. 17,753. July 15. (Germany, June 14, '24.)

Chemische Fabrik auf Actien vorm. E. Schering. Manufacture of di-acylisothiourea-S-alkylethers. 17,672. July 14. (Germany, July 16, '25.)

Drescher, H. A. E., Harris, J. E. G., Scottish Dyes, Ltd., Thomas, J., and Wylam, B. Dyes and dyeing. 17,892. July 16.

Haythornthwaite, A., and May and Baker, Ltd. Manufacture of solutions of bismuth salts of arylarsinic and arylstibinic acids. 17,903. July 16.

Heberlein and Co. Akt.-Ges. Process for chemically varying vegetable fibres. 17,548. July 13. (Germany, July 14, '25.)

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Catalytic decomposition of cyclic compounds. 17,391. July 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of dyestuffs containing chromium. 17,948. July 17.

I. G. Farbenindustrie Akt.-Ges. Manufacture of photographic silver halide emulsions. 17,550. July 13. (Germany, Oct. 7, '25.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of heterocyclic compounds. 17,656. July 14. (Germany, Sept. 15, '25.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of active colloids. 17,854. July 16. (Germany, July 22, '25.)
May and Baker, Ltd. Manufacture of tellurium compounds for therapeutic application. 17,904. July 16.
Schindelmeiser, J. Production of sulphur trioxide and sulphuric acid. 17,890. July 16.
Scottish Dyes, Ltd., Thomas, J., and Thomson, R. F. Manufacture of dyestuffs, etc. 17,570. July 13.
Soc. of Chemical Industry in Basle. Manufacture of dyestuffs. 17,655. July 14. (Switzerland, August 1, '25.)

German Trade in Oilseeds

Getting Back to Pre-war Figures

FIGURES recently published in Germany indicate that her imports of oilseeds are rapidly approaching the pre-war standard. Under all the circumstances, and especially in view of the strenuous competition of this country and of the U.S.A.—to say nothing of France—for the world's available supplies of oilseeds and nuts, this is a rather remarkable and creditable performance. It is one, also, that is well worth noting, when considered in conjunction with the decrease in U.K. imports in 1925; a slight decrease, it is true, but these things are indicative of tendencies which may grow. The following table gives the German imports for 1913 and 1925:—

	1913. Metric Tons.	1925. Metric Tons.
Palm kernels	235,900	225,400
Copra	196,400	172,100
Linseed	560,300	250,700
Ground-nuts	98,100	323,500
Sesame seed	116,000	20,800
Cotton seed	219,800	46,700
Rape seed	153,400	49,300
Sunflower seed	20,500	86,600
Soya beans	125,700	336,200
	1,726,100	1,511,300

Palm kernels and copra have nearly returned to the 1913 level. The tremendous decline in linseed is nearly counterbalanced by a corresponding augmentation of ground-nuts supplemented probably by an extension in home-grown flax (linseed). A heavy increase in soya beans also probably goes a long way to counterbalance the reduced linseed imports, for soya bean oil is a valuable addition to or substitute for linseed oil in paint manufacture. The decline in rape seed imports may be made up to some extent by increased home supplies. Some years ago there was in Germany a very loud demand for a wide extension of home-grown oilseed crops, but little came of it, and although flax and rape and possibly also sunflower are somewhat more extensively grown, it is evident that Germany is looking mainly to imports of foreign seeds and nuts to supply her great oil-milling industry.

Germany obtains her sunflower seed almost entirely from Russia; her ground-nuts mainly from India, China and West Africa; sesame from China; cotton seed from Egypt; soya beans from China; and palm kernels from British West Africa. She also imports large quantities of vegetable oil—*e.g.*, in 1925, 18,580 tons of palm oil, 33,470 tons of bean oil, 26,600 tons of linseed oil, and 14,000 tons of cotton seed oil.

Dry Cleaning of Artificial Silk

DRY cleaning will not injure fabrics containing rayon (artificial silk) or any other synthetic fibres now in general use in the cotton industry, according to a report issued by Russell T. Fisher, secretary of the National Association of Cotton Manufacturers of America. This statement follows a series of tests conducted by the association in co-operation with several of its members and a similar investigation on the laundering of rayon. The report is the only official and authoritative one issued on the subject by the manufacturers, and is said to dispel any doubt which may have existed as to the effect of dry cleaning of goods containing rayon and other synthetic fibres. This question has been frequently raised during the last year, and the investigation was conducted because there was apparently no conclusive evidence available.

Sweden's Chemical Progress

Chief Lines of Development

THE annual report of Sveriges Kemiska Industrikontor, published on April 7, states that the chemical industries in Sweden were occupied to a somewhat greater extent in 1925 than in the previous year. While the economic results in one branch experienced an improvement, normal prices were hampered by the severe competition both in the home and foreign markets.

The turnover in superphosphate in Sweden was increased both in the spring and the autumn season, so that the pre-war figures were for the first time again attained and slightly exceeded. The specially good harvest of almost all crops during 1925 gives occasion for assuming that the consumption in 1926 will be further augmented. In the home market the prices of superphosphate were about the same as during the autumn, but lower than in the spring of 1924. The exports in 1925 reached record figures at 88,600 metric tons as compared with 62,500 tons in 1924 and 36,000 tons in 1913. Nevertheless competition rendered matters difficult so that the possibilities of earning profits were limited. The exports were chiefly sent to the east, the Baltic States and to Russia. The increase in the production of superphosphate last year also stimulated the output of sulphuric acid, which rose above the pre-war level.

In the home cement market the report states that the turnover was about the same as in 1924, although prices experienced an inconsiderable increase. On the other hand the exports largely increased, amounting to 136,964 tons as contrasted with 66,100 tons in 1924 and 137,100 tons in 1913, but the prices realised for the exports last year were low. As to the reason for the expansion in exports the report mentions labour disputes in some competitive countries and the increase in the value of the exchange in the same countries. Still, competition with other nations was difficult in export markets, where the countries having a depreciated currency continue to cause great injury to the Swedish industry. In the home market too rivalry from abroad was also perceptible, although the imports of cement were lower than in 1924.

Coming to consider the question of the porcelain industry the report records an increase in the production in the second half of last year. But the reductions in prices that have had to be made in recent years as a consequence of foreign competition have been so large that the margin of profit is extremely moderate. Moreover, business with Norway and Denmark is hampered by the great deflation of the currency. The imports of porcelain from Germany and Czecho-Slovakia continue to be considerable, and it is submitted that the exports from these two countries represent material sent out at dumping prices. The prospects for the future are declared to be gloomy.

Cellophane Dialysing Membranes

DONNA E. KERR and Dr. H. W. Hill, director of the Vancouver General Hospital Laboratories, have tested the use of cellophane as a sterilising dialysing membrane, and the results may be of value in bacteriology and other fields. In searching for a sterilisable dialysing membrane, a suggestion came from the Christmas boxes of candy wrapped in glistening sheets of "paper." The resemblance of this material to thin sheets of collodion induced them to try its dialysing powers, which, for silver nitrate, sodium chloride and glucose, proved perfect. The next step was to test its resistance to sterilisation. Fifteen pounds of steam for twenty minutes in an ordinary laboratory autoclave left it unchanged in appearance, feel, etc. Its dialysing powers were still unaffected. The various uses of such a membrane in physics, chemistry, and especially in bacteriology and biology, both scientific and applied, are obvious. With any household cement, sheets of it may be made into tubes, flat, square or round bags, etc. Diaphragms of it may be cemented across bowls, beakers, or glass tubes.

THE FORMATION OF AN INTERNATIONAL COPPER TRUST, with the power to control the price of metal throughout the world, is announced from America, where it is stated 90 per cent. of the American copper producers with associated mine owning corporations in Great Britain, Germany, Chile, Japan, and Mexico belong to the trust. It is reported, however, that before engaging in business in America it must have the Federal Trade Commission's approval.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £37 per ton, Powder, £39 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. d/d; Contract, £8 10s. d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystal, £23 per ton. Powder, £24 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORATE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3½d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—3d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4½d. to 5d. per lb. Crude 60's, 1s. 5d. to 1s. 6d.

ACID CRESYLIC 97/99.—1s. 8d. to 1s. 10d. per gall. Pale, 95%, 1s. 6d. to 1s. 8d. per gall. Dark, 1s. 3d. to 1s. 6d. per gall. Steady.

ANTHRACENE.—A quality, 3d. to 4d. per unit.

ANTHRACENE OIL, STRAINED.—7d. to 8d. per gall. Unstrained, 6½d. to 7½d. per gall.

BENZOL.—Crude 65's, 1s. 3d. to 1s. 4d. per gall., ex works in tank wagons. Standard Motor, 2s. per gall., ex works in tank wagons. Pure, 1s. 10½d. to 2s. 9d. per gall., ex works in tank wagons.

TOLUOL.—90%, 1s. 9½d. to 2s. 3d. per gall. Pure, 2s. 3d. to 2s. 9d. per gall.

XYLOL.—2s. 4d. to 2s. 9d. per gall. Pure, 3s. 3d. per gall.

CREOSOTE.—Creosylic, 20/24%, 9d. to 10d. per gall. Standard specification, middle oil, 6½d. to 7½d. per gall. Heavy, 7½d. to 8½d. per gall.

NAPHTHA.—Crude, 9½d. to 1s. 0½d. per gall. according to quality. Solvent 90/160, 2s. to 2s. 3d. per gall. Solvent 90/190, 1s. 3d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £3 10s. to £5 per ton. Whizzed or hot pressed, £5 10s. to £7 10s.

NAPHTHALENE.—Crystals and Flaked, £11 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 82s. 6d. to 87s. 6d. per ton.

PYRIDINE.—90/140, 17s. to 20s. per gall. Heavy, 7s. to 10s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. 6d. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7d. per lb. naked at works.

ANILINE SALTS.—7d. to 7½d. per lb. naked at works.

BENZALDEHYDE.—2s. 1d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

o-CRESOL 29/31° C.—3d. to 3½d. per lb.

m-CRESOL 98/100%.—2s. 1d. to 2s. 3d. per lb.

p-CRESOL 32/34° C.—2s. 1d. to 2s. 3d. per lb.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. to 2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLANILINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. 2d. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. 3d. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—5d. per lb. naked at works.

NITRONAPHTHALENE.—10d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 9d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8. Grey, £17 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£7 to £9 per ton, according to grade and locality.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall., 24° Tw.

RED LIQUOR.—9½d. to 1s. per gall.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 6d. per gall. 60% O.P. Solvent, 3s. 6d. per gall. 40% O.P.

WOOD TAR.—£3 to £5 per ton, according to grade.

BROWN SUGAR OF LEAD.—£39 to £40 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£46 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5½d. to 6½d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

Acid, Acetic, 80% B.P.—£39 per ton ex wharf London in glass containers.

Acid, Acetyl Salicylic.—2s. 4d. to 2s. 6d. per lb. Brisk demand.

Acid, Benzoic B.P.—2s. to 2s. 3d. per lb., according to quantity.

Acid, Boric B.P.—Crystal, £43 per ton; Powder, £47 per ton. Carriage paid any station in Great Britain, in ton lots.

Acid, Camphoric.—19s. to 21s. per lb.

Acid, Citric.—1s. 4d. to 1s. 4½d. per lb., less 5%.

Acid, Gallic.—2s. 8d. per lb. for pure crystal, in cwt. lots.

Acid, Pyrogallic, Crystals.—6s. 7d. per lb. Resublimed, 7s. 3d.

Acid, Salicylic.—1s. 4d. to 1s. 5½d. per lb. Technical.—10¾d. to 11d. per lb.

Acid, Tannic B.P.—2s. 10d. per lb.

Acid, Tartaric.—1s. 0½d. per lb., less 5%. Market firm.

Amidol.—8s. 6d. per lb., d/d.

Acetanilide.—1s. 7d. to 1s. 8d. per lb. for quantities.

Amidopyrin.—12s. 6d. per lb.

Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb., according to quantity.

Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.

Atropine Sulphate.—11s. per oz. for English make.

Barbitone.—9s. per lb.

Benzonaphthol.—3s. 3d. per lb. spot.

Bismuth Carbonate.—12s. 6d. to 14s. 3d. per lb.

Bismuth Citrate.—9s. 6d. to 11s. 3d. per lb.

Bismuth Salicylate.—10s. 3d. to 12s. per lb.

Bismuth Subnitrate.—10s. 9d. to 12s. 6d. per lb. according to quantity.

Borax B.P.—Crystal, £27; Powder, £28 per ton. Carriage paid any station in Great Britain, in ton lots.

Bromides.—Potassium, 1s. 9d. to 1s. 11d. per lb.; sodium, 1s. 11d. to 2s. 2d. per lb.; ammonium, 2s. 2d. to 2s. 5d. per lb., all spot.

Calcium Lactate.—1s. 4d. to 1s. 5d.

Chloral Hydrate.—3s. 3d. to 3s. 6d. per lb., duty paid.

Chloroform.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

Creosote Carbonate.—6s. per lb.

Formaldehyde.—£40 per ton, in barrels ex wharf.

Guaiacol Carbonate.—7s. 6d. per lb.

Hexamine.—2s. 4d. to 2s. 6d. per lb.

Homatropine Hydrobromide.—30s. per oz.

Hydrastine Hydrochloride.—English make offered at 120s. per oz.

Hydrogen Peroxide (12 vols.).—1s. 8d. per gallon f.o.r. makers' works, naked.

Hydroquinone.—4s. 3d. per lb., in cwt. lots.

Hypophosphites.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

Iron Ammonium Citrate B.P.—2s. to 2s. 3d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 1d. to 2s. 4d. per lb.

Iron Perchloride.—20s. to 22s., according to quantity.

Magnesium Carbonate.—Light Commercial, £31 per ton net.

Magnesium Oxide.—Light Commercial, £67 10s. per ton, less 2½%, price reduced; Heavy Commercial, £22 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.

Menthol.—A.B.R. recrystallised B.P., 17s. 9d. net per lb., Synthetic, 12s. to 14s. per lb., according to quality.

Mercurials.—Red oxide, 5s. 11d. to 6s. 1d. per lb.; Corrosive sublimate, 4s. 3d. to 4s. 5d. per lb.; white precipitate, 4s. 9d. to 4s. 11d. per lb.; Calomel, 4s. 6d. to 4s. 8d. per lb.

Methyl Salicylate.—1s. 7d. per lb.

Methyl Sulphonal.—16s. 6d. per lb.

Metol.—10s. per lb. British make.

Paraformaldehyde.—1s. 9d. for 100% powder.

Paraldehyde.—1s. 4d. per lb. (1s. 2d. in carboys.)

Phenacetin.—4s. per lb.

Phenazone.—6s. per lb.

Phenolphthalein.—4s. per lb.

Potassium Bitartrate 99/100% (Cream of Tartar).—80s. per cwt., less 2½% for ton lots.

Potassium Citrate.—2s. to 2s. 1d. per lb.

Potassium Ferricyanide.—1s. 9d. per lb. in cwt. lots. Quiet.

Potassium Iodide.—16s. 8d. to 17s. 2d. per lb., according to quantity.

Potassium Metabisulphite.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

Potassium Permanganate.—B.P. crystals, 6½d. per lb., spot.

Quinine Sulphate.—1s. 8d. to 1s. 9d. per oz., in 100 oz. tins,

Resorcin.—4s. to 5s. per lb., spot.

Saccharin.—55s. per lb.

Salol.—3s. per lb.

Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb.

Sodium Citrate, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923. 2s. to 2s. 2d. per lb., according to quantity.

Sodium Ferrocyanide.—4d. per lb. carriage paid.

Sodium Hyposulphite, Photographic.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

Sodium Nitroprusside.—16s. per lb.

Sodium Potassium Tartrate (Rochelle Salt).—75s. to 80s. per cwt., according to quantity.

Sodium Salicylate.—Powder, 1s. 9d. to 1s. 10d. per lb. Crystal, 1s. 10d. to 1s. 11d. per lb.

Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.

Sodium Sulphite, anhydrous, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

Sulphonal.—11s. per lb.

Tartar Emetic, B.P.—Crystal or Powder, 1s. 10d. to 1s. 11d. per lb.

Thymol.—12s. to 13s. 9d. per lb.

Perfumery Chemicals

Acetophenone.—10s. per lb.

Aubepine (ex Anethol).—10s. per lb.

Amyl Acetate.—3s. per lb.

Amyl Butyrate.—5s. 6d. per lb.

Amyl Salicylate.—3s. 3d. per lb.

Anethol (M.P. 21/22° C.).—5s. 9d. per lb.

Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 3d. per lb.

Benzyl Alcohol free from Chlorine.—2s. 3d. per lb.

Benzaldehyde free from Chlorine.—2s. 6d. per lb.

Benzyl Benzoate.—2s. 9d. per lb.

Cinnamic Aldehyde Natural.—17s. 9d. per lb.

Coumarin.—11s. 9d. per lb.

Citronellol.—15s. per lb.

Citral.—10s. per lb.

Ethyl Cinnamate.—10s. per lb.

Ethyl Phthalate.—3s. per lb.

Eugenol.—10s. per lb.

Geraniol (Palmarosa).—20s. per lb.

Geraniol.—6s. 3d. to 11s. 6d. per lb.

Heliotropine.—5s. per lb.

Iso Eugenol.—14s. per lb.

Linalol.—14s. to 17s. 6d. per lb.

Linalyl Acetate.—17s. to 20s. per lb.

Methyl Anthranilate.—9s. 3d. per lb.

Methyl Benzoate.—5s. per lb.

Musk Ketone.—34s. 6d. per lb.

Musk Xylol.—8s. per lb.

Nerolin.—3s. 9d. per lb.

Phenyl Ethyl Acetate.—12s. per lb.

Phenyl Ethyl Alcohol.—9s. 6d. per lb.

Rhodinol.—27s. 6d. per lb.

Safrol.—1s. 6d. per lb.

Terpineol.—1s. 6d. per lb.

Vanillin.—21s. 9d. per lb.

Essential Oils

Almond Oil.—11s. 6d. per lb.

Anise Oil.—3s. per lb.

Bergamot Oil.—27s. per lb.

Bourbon Geranium Oil.—12s. per lb.

Camphor Oil.—67s. 6d. per cwt

Cananga Oil, Java.—20s. per lb.

Cinnamon Oil, Leaf.—6d. per oz.

Cassia Oil, 80/85%.—8s. 9d. per lb.

Citronella Oil.—Java, 85/90%, 2s. 8d. Ceylon, 2s. per lb.

Clove Oil.—7s. per lb.

Eucalyptus Oil, 70/75%.—2s. per lb.

Lavender Oil.—French 38/40%, Esters, 15s. 6d. per lb.

Lemon Oil.—7s. 9d. per lb.

Lemongrass Oil.—4s. 6d. per lb.

Orange Oil, Sweet.—10s. 9d. per lb.

Otto of Rose Oil.—Bulgarian, 65s. per oz. Anatolian, 30s. per oz.

Palma Rosa Oil.—9s. 9d. per lb.

Peppermint Oil.—Wayne County, 67s. 6d. per lb. Japanese, 10s. 6d. per lb.

Petitgrain Oil.—9s. per lb.

Sandal Wood Oil.—Mysore, 26s. per lb. Australian, 17s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, July 21, 1926.

THE improvement in business which we indicated last week has been fairly well maintained, although the market is of course overshadowed by the industrial situation. Prices on the whole are steady. The export market is without special feature.

General Chemicals

ACETONE.—Competition is intensified. Prices are lower and nominal. Buyers should ascertain market position before purchasing.

ACID ACETIC is a steady market. Price is unchanged. Export demand has been active.

ACID FORMIC remains rather quiet. Price is very firm.

ACID LACTIC is quoted at £43 per ton for 50% by weight. There is a little more demand than of late.

ACID OXALIC is only in moderate inquiry. Price is firm at 3⅛d. per lb.

ACID TARTARIC is fairly active at 11¾d. per lb.

ALUMINA SULPHATE.—Not much business has been passing. To-day's price is about £5 10s. to £5 12s. 6d. per ton for the higher grade.

AMMONIUM CHLORIDE.—Unchanged.

ARSENIC.—Unchanged. Price remains nominal.

BARIUM CHLORIDE seems likely to go higher in price and the current quotation is about £10 per ton.

EPSOM SALTS.—Unchanged.

FORMALDEHYDE has been in better demand. Price is firm at £40-£41 per ton.

IRON SULPHATE.—Unchanged.

LEAD ACETATE is rather weaker at about £45 for white and £43 for brown.

METHYL ALCOHOL.—American prices have advanced, but price in England remains at the moment unchanged at about £48 per ton.

METHYL ACETONE is higher in price at £55 per ton.

POTASSIUM CARBONATE.—Unchanged.

POTASSIUM CHLORATE exhibits a firmer tendency, to-day's price being 3¾d. per lb.

POTASSIUM PERMANGANATE is quiet and price unchanged at 7d. per lb. for pharmaceutical quality.

POTASSIUM PRUSSIATE is firm at 7¾d. per lb.

SODA ACETATE is very scarce, spot price commanding £22 per ton.

SODA BICHROMATE is active. Price unchanged.

SODA NITRITE is in very slow demand—price £20 10s. per ton.

SODA PHOSPHATE.—Unchanged.

SODA PRUSSIATE is firm and scarce—price about 3¾d. per lb.

SODA SULPHIDE.—Unchanged.

ZINC SULPHATE.—Unchanged.

Coal Tar Products

Owing to the continuation of the coal strike there is no change in the market for coal tar products.

Latest Oil Prices

LONDON.—LINSEED OIL closed quiet at 2s. 6d. to 7s. 6d. decline, spot, £35 5s. ex mill; July and August, £34 2s. 6d.; September-December, £34 10s.; January-April, £34 17s. 6d. RAPE OIL quiet. Crude, extracted, spot, £49, naked; Japanese crude, July-August shipment, £46 barrels. COTTON OIL firm. Refined common edible, £46; Egyptian, crude, £40 10s.; deodorised, £48. TURPENTINE firm and 6d. dearer. American spot, 62s. 3d.; and July-December, 63s. per cwt.

HULL.—LINSEED OIL.—Naked, spot, £34 15s.; July to September-December, £34 15s.; January-April, £35. COTTON OIL.—Naked, Bombay crude, £37; Egyptian crude, £41; edible refined, £45; technical, £41. PALM KERNEL OIL.—Crushed naked, 5½ per cent., £42 7s. 6d. GROUNDNUT OIL.—Crushed-extracted, £47; deodorised £51. SOYA OIL.—Extracted and crushed, £38; deodorised, £41 10s. RAPE OIL.—Crude-extracted, £48; refined, £50 per ton, net cash terms, ex mill. CASTOR OIL and COD OIL.—Unchanged.

Calcium Cyanamide

THE new prices for Britain have not yet been announced but lower prices are anticipated as those fixed for Belgium on a sterling basis indicate a reduction on last year's figures.

Nitrogen Products

Export.—The sulphate of ammonia position remains unchanged. British producers are basing their sales on £10 15s. per ton f.o.b. U.K. port in single bags, with slightly higher prices for little lots. The quantities available for export are very small. It is reported that considerable business for delivery between now and the end of the year has been made by large continental producers. There seems little doubt that the market will absorb the increased production of sulphate of ammonia at the scale of prices indicated by the continental producers.

Home.—British producers continue to sell on the basis of March/May prices for July delivery. It is expected in certain quarters that some reduction in this figure will be made before long. Originally it was understood that these prices would operate while the coal stoppage continued, but delay in a settlement of the mining difficulty has exceeded expectations. As the demand for the summer months is quite small, this is having only a small effect on producers, traders, and consumers.

Nitrate of Soda.—The market has remained very quiet during the last fortnight, and the business transacted has been insignificant. Prices are unchanged. The negotiations in Valparaiso between the nitrate interests and the Chilean Government have produced no results so far, though the Government are said to be still considering the matter. It seems likely that the price scale of the producers is still too high to permit of any substantial reduction of nitrate stocks. The price for July shipment is 18s. 4d. per metric quintal f.a.s. Chile.

Thermometers for Aircraft

A special catalogue (List T.12) of thermometers for use in aircraft has been prepared by Negretti and Zambra, of 38, Holborn Viaduct, London, E.C.1. Thermometers are supplied for:—(1) Determining the temperature of the lubricating oil (oil temperature thermometers). These are of the mercury-in-steel type, the expansion of mercury being conveyed to an indicator of the Bourdon type by a steel capillary tube; (2) Determining the air temperature, for use in determining altitudes and for the collection of scientific data. These are also of the mercury-in-steel type, generally sealed from 35° to 55° C. Thermometers of the alcohol-in-glass type are also supplied, where only approximate accuracy is required. (3) Determining the temperature of the radiator water (radiator thermometers). Two types of instrument are supplied for this purpose, either the mercury-in-steel pattern, which is used for measurements requiring a high degree of accuracy, or an instrument working on the ether vapour pressure principle, which is not so accurate as the first type.

Italian Economy Measures

CERTAIN measures have recently been agreed to by the Italian Cabinet, which are intended to operate in three directions: firstly, to increase the production and lower the cost of certain articles; secondly, to reduce the cost of certain materials which are the basis of production; and, thirdly, to limit all luxurious consumption. Among matters of chemical interest arising out of these measures may be mentioned the effort to check the importation into Italy of foreign paper and cellulose. At present Italy does not manufacture enough paper for her needs, and imports it chiefly from Germany, Austria, and Jugo-Slavia. Cellulose is also imported. As from July 1 newspapers are not to be allowed to appear in more than six pages. At present the number of pages varies from six to twelve. The mixing of benzene with alcohol has also been approved, with the object of limiting imports and encouraging the use of alcohol, which can be produced in Italy. The working day has been extended from eight to nine hours.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

GLASGOW, *July* 21, 1926.

APART from the continuance of the coal stoppage, local holidays have also greatly hampered sales of heavy chemicals during the past week. The inquiries received were mostly for export. There is no change in price of any importance to record.

Industrial Chemicals

ACID ACETIC, 98/100%.—£55 to £67 per ton, according to quantity and packing, c.i.f. U.K. port; 80% pure, £39 to £41 per ton; 80% technical, £38 to £39 per ton.

ACID BORIC.—Crystal, granulated or small flakes, £37 per ton; powdered, £39 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In moderate demand and quoted price unchanged at 4¾d. per lb., delivered or f.o.b. U.K. port.

ACID CITRIC, B.P. CRYSTALS.—In rather better demand, but quoted price unchanged at 1s. 3½d. per lb., less 5%, ex store. On offer at slightly less for prompt shipment.

ACID FORMIC, 85%.—Offered from the continent at about £51 per ton, c.i.f. U.K. ports. Spot material quoted £52 10s. per ton, ex wharf.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80°.—Usual steady demand and price unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Remains unchanged at about 3½d. per lb., ex store. Offered for early delivery from the continent at 3⅜d. per lb., ex wharf.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Spot material quoted 11¾d. per lb., less 5%, ex wharf, or 11½d. per lb., less 5%, ex wharf, prompt shipment.

ALUMINA SULPHATE, 17/18%, IRON FREE.—On offer from the continent at about £5 8s. 6d. per ton, c.i.f. U.K. ports. Spot material quoted £6 5s. per ton, ex store.

ALUM, LUMP POTASH.—Spot material unchanged at about £9 5s per ton, ex store. Quoted £8 per ton, c.i.f. U.K. ports, prompt shipment. Crystal powder, on offer at about £7 15s. per ton, c.i.f. U.K. port. Spot material available at £8 7s. 6d. per ton, ex store.

AMMONIA ANHYDROUS.—Imported material selling at about 11¼d to 11½d. per lb., ex wharf, containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers crystals of British manufacture quoted £23 10s. to £25 10s. per ton, ex station. Continental on offer at about £21 10s. per ton, c.i.f. U.K. ports. Fine white crystals of continental manufacture quoted £18 5s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Inclined to be higher. Now offered for prompt shipment at about £15 15s. per ton, ex wharf. Spot material quoted £16 15s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Spot material unchanged at about £10 10s. per ton, ex store. Offered from the continent at about £9 5s. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—English material unchanged at £9 10s. per ton, ex station, contracts 20s. per ton less. Continental now quoted £7 15s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £22 10s. per ton; crystals, £23 per ton; powdered, £24 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental about £3 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Quoted £3 10s. per ton, f.o.r. works. Moderate inquiry for export and price about £4 2s. 6d. per ton, f.o.b. U.K. port.

COPPER SULPHATE, 99/100%.—Continental material on offer at about £22 10s. per ton, ex wharf. English material for export quoted £23 5s. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Quoted £38 10s. per ton, c.i.f. U.K. ports. Spot material available at £40 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £3 per ton c.i.f. U.K. ports.

LEAD, RED.—Imported material rather dearer at £37 15s. per ton, ex store.

LEAD, WHITE.—Quoted £38 15s. per ton, ex store.

LEAD, ACETATE.—White crystals quoted £45 per ton, c.i.f. U.K. ports, prompt shipment. Brown about £40 10s. per ton, c.i.f. U.K. ports.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

POTASH CAUSTIC, 88/92%.—Syndicate prices vary from £25 10s. to £28 15s. per ton, c.i.f. U.K. ports, according to quantity and destination. Spot material available at about £29 per ton.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Quoted £25 5s. per ton, ex wharf, early delivery. Spot material on offer at £26 10s. per ton, ex store; 90/94% quality quoted £22 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 98/100%.—Powdered on offer at £26 15s. per ton, c.i.f. U.K. ports. Crystals, £28 per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE (SALTPETRE).—Unchanged at about £22 5s. per ton, c.i.f. U.K. ports. Spot material available at £24 per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 7½d. per lb., ex store, spot delivery. To come forward 7d. per lb., ex wharf.

POTASSIUM PRUSSIATE, YELLOW.—Quoted 7½d. per lb., ex wharf.

SODA CAUSTIC, 76/77%.—£17 10s. per ton; 70/72%, £16 2s. 6d. per ton; broken, 60%, £16 12s. 6d. per ton; powdered, 98/99%, £20 17s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—English material quoted £22 per ton, ex station. Continental on offer at about £20 10s. per ton, ex store, or to come forward £19 15s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—English price unchanged at 3¾d. per lb. delivered.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more (alkali 58%), £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE OF SODA.—Large crystals of English manufacture quoted £9 per ton, ex station, minimum 4 ton lots; pea crystal, £14 10s. per ton, ex station. Continental commercial on offer at about £7 15s. per ton, c.i.f. U.K. ports.

SODIUM NITRATE.—Quoted £13 per ton, ex store; 96/98%, refined quality 7s. 6d. per ton extra.

SODIUM NITRITE, 100%.—Quoted £24 per ton, ex store. Offered from the continent at about £22 5s. per ton, c.i.f. U.K. ports.

SODIUM PRUSSIATE, YELLOW.—Offered for early delivery at 4d. per lb., ex wharf. Spot material quoted 4½d. per lb., ex store.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE, 60/62%.—Solid, £13 5s. per ton; broken, £14 5s. per ton; flake, £15 5s. per ton; crystals, 31/34%, £8 12s. 6d. per ton. All delivered buyers' works, U.K., minimum 5 ton lots, with slight reduction for contracts. 60/62%, solid quality offered from the continent at about £9 15s. per ton, c.i.f. U.K. ports. Broken, 15s. per ton more. Crystals, 30/32%, £7 per ton, c.i.f. U.K. port.

SULPHUR.—Flowers, £11 10s. per ton; roll, £10 5s. per ton; rock, £10 5s. per ton; floristella, £9 15s. per ton; ground American, £9 per ton, ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material, 96/98%, quoted £23 15s. per ton, f.o.b. U.K. ports; 98/100%, solid on offer from the continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental make on offer at about £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

PARANITRANILINE.—1s. 9d. per lb. Some home inquiries.

ALPHA NAPHTHOL.—2s. per lb. Small inquiries.

DIMETHYLANILINE.—2s. per lb. Small inquiries.

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb. Some inquiries.

SULPHANILIC ACID.—9d. per lb. Some inquiries.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, July 22, 1926.

The demand for chemicals this week has been up to the quiet level of the past month or so, neither better nor worse. Buying for home use, as before, has been mainly for prompt or early delivery, and in few cases have the quantities disposed of been of much bulk. On the export side the demand has also been quiet, particularly the Continental markets, with the Dominions and the East perhaps the best buyers in a slow market. Values generally keep pretty steady and few changes of any importance have taken place.

Heavy Chemicals

Alkali has sold in moderate quantities and quotations are unaltered at £6 15s. per ton. A quietly steady demand has also been experienced for caustic soda at from £15 2s. 6d. per ton for 60 per cent. to £17 10s. for 76 per cent. material. Saltcake and glauber salts have moved very sluggishly but prices remain at £3 to £3 5s. and £3 15s. per ton, respectively. Hyposulphite of soda is in quiet demand with quotations well maintained at £9 15s. for commercial and £15 to £15 5s. per ton for photographic quality. Bleaching powder has not been called for to any important extent but prices are held at £8 10s. per ton. Nitrate of soda is steady at from £20 to £21 per ton but the demand is rather poor. Prussiate of soda is in slow request at about 3⅞d. per lb. Chlorate of soda is being offered at about 3¼d. per lb., but there has not been much call for it this week. Acetate of soda is in small demand but supplies are not over-plentiful and values are quite steady at about £21 10s. per ton. Bichromate of soda meets with a fair inquiry at steady prices, round 3¼d. per lb. being quoted here for this product this week.

Among the potash products caustic is firm at about £27 per ton, and a moderate amount of business has been done. There is only a slow demand reported for yellow prussiate of potash, with prices varying from 6¾d. to 7d. per lb. Permanganate of potash is in quiet request at steady prices; commercial material is quoted at from 5d. to 5¼d. per lb. and B.P. at round 7d. per lb. Carbonate of potash is in moderate inquiry, with 90 per cent. material on offer at about £25 15s. per ton. Chlorate of potash is fairly steady at 3¼d. per lb., but there has not been a great deal of business done in this since last report.

Export business in sulphate of copper remains inactive, with about £23 per ton, f.o.b., now quoted. Inquiry for arsenic is also limited, white powdered, Cornish makes, offering at £13 5s. to £13 10s. per ton, on rails. The lead compounds remain firm although there is not a very big call for them at present. White acetate of lead is quoted at £45 to £46 per ton, and brown at £41, with nitrate of lead also offering at round £41 per ton. Grey acetate of lime is somewhat dearer at £16 per ton, brown being about unchanged at £8.

Acids and Tar Products

There is a small trade passing in acetic acid at steady prices; commercial 80 per cent. is offered at from £37 to £38 per ton and glacial at £67. Oxalic acid meets with a limited demand at 3½d. to 3¾d. per lb. Citric acid is steady and in quiet request at 1s. 3½d. per lb., with tartaric acid in much the same position at round 11¾d. per lb.

As regards coal tar products prices now being quoted are to a large extent nominal in view of the very short supplies and the difficulty of doing prompt business. For export pitch is now quoted forward at round 85s. per ton, f.o.b., although there are not many orders being booked at the moment. Creosote oil is firm at 6¾d. to 7d. per gallon. Carbolic acid is virtually off the market. Aniline oil and salt are firm at up to 8d. per lb. For cresylic acid round 2s. 1d. is now being quoted.

Dr. Clayton Approves Co-Partnership

Speaking last week at the annual meeting of the Association of British Chemical Manufacturers, Dr. Clayton said that there was a distinct interest taken in chemical matters now in the House of Commons and there was also a great deal of interest being taken by the Government in the Department of Scientific and Industrial Research, which was following up all the scientific problems and making very great use of the scientific knowledge that we had in this country. It was also keeping in very close touch with the developments on the Continent, and a great deal that was being done for the better use of coal was showing more prospect now of a satisfactory issue. There was a committee in the House considering co-partnership schemes with a view, not to passing any specific legislation, but with a view to advising manufacturers on the possibilities of co-partnership and helping them to make arrangements suitable for their particular industry. He thought that was quite a useful thing to do; to try to get the employees of firms really interested in the success of the undertaking which employed them. Their great difficulty was to persuade the men that they were really vitally interested in the success of the undertaking that gave them employment, and it was in view of that this committee was going to investigate the different methods of giving the employees of a firm a real interest in the firm which employed them.

Gas Light and Coke Co. Bill

Proposed 5 per Cent. Minimum Dividend

A committee of the House of Lords presided over by Lord Beauchamp, considered on Tuesday and Wednesday a Bill promoted by the Gas Light and Coke Company. Most of the provisions were of a domestic nature, concerning the company's finances, but there was discussion on two clauses, the purpose of which was to increase the company's powers in respect of the borrowing of money, and to authorise a minimum dividend of 5 per cent. on the ordinary stock. There was opposition to the latter proposal by the London and Middlesex County Councils, and the City of London and East and West Ham Corporations, while some of these asked for some justification for the increased borrowing powers.

Mr. D. Milne Watson (governor and managing director of the company) said there were 15,000 employees of the company who were co-partners, holding more than half a million pounds' worth of the company's stock, and if there were a minimum of 5 per cent. they would be more inclined to increase their holdings.

Sir William Plender (Deloitte, Plender, Griffiths and Co.) agreed that the scheme would benefit all concerned, including consumers, and regarded a minimum dividend of 5 per cent. as reasonable for a company of this kind.

Mr. L. Currie (Glyn, Mills and Co., who have acted for the company for nearly 100 years) said a minimum dividend of 5 per cent. would increase the company's prestige when it entered the market for further money.

The Committee adjourned.

Textile Fibres: New Results

Dr. D. R. Nanji, of Birmingham University, and Dr. F. J. Paton, of the Bristol University Research Station, Campden, claim to have discovered a new process which may have important bearings on the preparation of fibres for the textile trade. The separation of the fibres in flax, now done by the "retting" process, can be accomplished more rapidly by the new process. More important still is the fact that material hitherto treated as waste can now be brought into use. The process renders possible the production of lustrous fibres comparable with, and in some respects superior to, artificial silk. The cost of the product ready for spinning is only about one-fourth of the cost of production of artificial silk. The raw materials for the process, which does not involve the solution of the cellulose material, are stated to be obtainable in unlimited quantity throughout the Empire. A method has been worked out for the production of ramie fibre (which may prove to be a serious rival to cotton) from China grass. The fibre thus produced is said to be quite soft, and comparable with the best cottons. There is also a method for the production of fibres suitable for cordage and other purposes from bamboo, of which enormous supplies are available within the Empire, being obtainable in many tropical countries at the insignificant cost of £2 to £3 per ton. The natural vegetable lustrous fibres prepared by the new process are claimed to be as strong as, if not stronger than, linen. In this connection, it may be added that one of the chief difficulties which artificial silk manufacturers have hitherto encountered is that the strength of the fibres suffers in the production of the lustre.

Company News

W. AND H. M. GOULDING.—A dividend of 5 per cent. on the ordinary shares for the year ended June 30 last is announced, payable, as usual, in two equal instalments on July 31 and December 31.

PREMIER OIL AND CAKE CO.—The profit for the year ended December 31 last amounted to £39,280, as compared with £75,188 for the previous year. The dividend on the preference shares to December 31, 1925, absorbs £34,431, leaving a balance to be carried forward of £3,452. No ordinary dividend is to be paid. The annual meeting will be held at Winchester House, London, on July 28, at noon.

CELLULOSE HOLDINGS AND INVESTMENT CO., LTD.—The directors announce that the extra interest payable to the 7 per cent. participating first mortgage debenture stockholders in respect of their participation in profits for the half-year ended June 30, 1926, is at the rate of 23s. 8d. per cent., free of tax (equivalent to £1 9s. 7d. gross). This extra interest, together with the fixed interest, is payable on August 3, 1926.

BRITISH CELANESE, LTD.—The trading profit for the year ended February 28 last amounted to £446,167, an increase of 10 per cent. over that for the previous year. The profit and loss account shows a final net profit, subject to depreciation, of £138,995. The directors propose to write off, out of the net profit, the discount on the new debentures, amounting to £18,750, and to place the remaining £120,245 to the credit of the depreciation reserve account.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICAL ADMIXING PLANT.—H.M. Senior Trade Commissioner in South Africa has forwarded specifications and drawing relative to a call for tenders by the Municipality of Bulawayo, Southern Rhodesia, for the supply, delivery and erection of chemical admixing plant, etc. Tenders must reach Bulawayo on or before noon on August 31, 1926. The documents can be seen by interested firms at Room 50 of the Department of Overseas Trade. (Reference A.X. 3,385.)

PHARMACEUTICAL PRODUCTS.—A firm of agents established in Munich desires to secure, on a commission basis, the representation of British manufacturers. (Reference No. 121.)

EDIBLE SOYA BEAN OIL, ETC.—A firm of commission agents established in Valparaiso wish to secure the representation of British manufacturers on a commission basis. (Reference No. 133.)

CHEMICALS, LINSEED OIL, ETC.—A commission agent of Rio de Janeiro desires to secure the local representation of British manufacturers of linseed oil and chemicals, etc. (Reference No. 132.)

Japan's Synthetic Ammonia Output

IN Japan, not only are the imports of sulphate of ammonia increasing, but important developments are in view respecting the production of synthetic ammonia. The Japan Artificial Fertilizer Co. claims that its experiments at extracting nitrogen from the air on the Haber system have proved successful from both technical and commercial standpoints. It is considering whether to increase its own capitalisation by 10,000,000 yen and include the new enterprise in its present establishment or to launch a new company. The Haber method was obtained by the Japanese Government from Germany during the war. With the object of using it, the Oriental Nitrogen Guild was formed, including Mitsui Bussan Kaisha, Mitsubishi Goshi Kaisha, Sumitomo interests, Sankyo Drug Manufacturing Co. and Japan Artificial Fertilizer Co. In order to start manufacturing, the last-mentioned concern must procure the consent of the other members of the guild. It is understood, however, that their tacit consent has already been obtained. Figures for recent years show a marked tendency on the part of Japanese agriculturists to abandon bean cake fertilisers for sulphate of ammonia, potassium sulphate, nitrate of soda and other artificial fertilisers. Sulphate of ammonia has proved particularly popular.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the registration of the following Trade Marks can be lodged up to August 14, 1926.

"ADE."

No. 470,376.—Class 1.—For chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. Frederick Thomas Metcalf, trading as Metcalf and Co., New Chemical Works, Holland Street, Manchester; manufacturer. June 7, 1926. (To be Associated. Sect. 24.)

No. 470,377.—Chemical substances prepared for use in medicine and pharmacy. Class 3.

"POLIMETALLIC."

467,816. For raw or partly prepared vegetable, animal and mineral substances used in manufactures. Class 4. Ajax, Ltd., 117, Central Street, London, E.C.1; manufacturers. March 5, 1926. (To be Associated. Sect. 24.)

Tariff Changes

BRAZIL.—A Decree dated May 12 prescribes regulations regarding the sale of chemical fertilisers in Brazil. Manufacturers or importers of fertilisers must, before offering them for sale, communicate to the Chemical Institute the name, kind and quality of the fertilisers in question, together with the commercial names or marks which distinguish them from similar products. The sales contract or invoice must give full particulars of the fertiliser to which it relates—*i.e.*, name, nature, origin (name of manufacturer or producer), the principal fertilising agents, and the percentage of nitrogen, phosphorus and potassium contained. The text of the regulations (in Portuguese) can be seen at the Department of Overseas Trade.

HUNGARY.—A Decree (No. 5,012 M.E.) of June 23 extends until January 1, 1927, the period during which the duties on petrol with a specific gravity of 0·735 to 0·790 (Tariff No. 322 (*a*) 2) on mineral illuminating oils with a specific gravity of 0·790 to 0·845 (Tariff No. 322*b*), and on other oils not specially mentioned in the tariff used for engines, spindle oils and similar light oils and fuel oil (Tariff No. 322*c*) are payable at the reduced rates of 6.20 gold kr. and 6.80 gold kr. per 100 kilogs. net respectively. Gas oil falling under Tariff No. 322 (*c*), imported from countries entitled to most-favoured-nation treatment in Hungary, remains subject to the "Conventional" rate of 4 gold kr. per 100 kilogs. net.

JAPAN.—A new tax is now being levied on drinks containing carbonic acid gas.

SOUTH AFRICA.—A Proclamation dated May 19, 1926, withdraws the dumping duty imposed on cement imported into the Union from Great Britain, Holland, Belgium, Germany, Norway, Sweden or Denmark at a lower rate of freight than 17s. 6d. per 2,000 lb. gross weight. A Proclamation (No. 109) imposes a dumping duty equal to the difference between the domestic value and the export price provided that such duty does not exceed one-half of the dutiable value on cement imported from Great Britain, Belgium, Germany, Sweden, Yugo-Slavia, or Mozambique.

SPAIN.—It is reported that a new scheme of safeguarding the steel industry is contemplated, although no details are available as yet.

Celotex Industry

IT is proposed to establish the manufacture in Queensland of celotex, a building material made from sugar cane after the sugar juices have been extracted from it. The manufacture of celotex in the Commonwealth has many attractive possibilities, for not only will the commercial utilisation of cane waste (bagasse) prove of benefit to the sugar industry by converting what is at present a nuisance into a valuable by-product, but it will, at the same time, found a new industry in Australia.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

GREY (B. H.) AND SONS, Valley Mills, Meanwood, Leeds, dyers and finishers. (C.C., 24/7/26.) £21 17s. 10d. June 17.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

HORTON MANUFACTURING CO., LTD., Rickmansworth, liquid soap manufacturers. (M., 24/7/26.) Registered July 8, £4,000 2nd debentures (filed under section 93 (3) of the Companies (Consolidation) Act 1908), present issue £3,000; general charge (subject to £3,000 1st debenture dated June 29, 1926). *£7,100 debentures. £400 mortgage. September 8, 1925.

MILLBAY LAUNDRY, CLEANING AND DYEING CO., LTD., Plymouth. (M., 24/7/26.) Registered July 12, £1,500 mortgage, to R. Hancock, Callington, solicitor; charged on 17, Cornwall Street, Plymouth. *£11,070. April 8, 1926.

PRENTICE BROTHERS, LTD., Stowmarket, chemical manufacturers. (M., 24/7/26.) Registered July 7, debenture, to bank; general charge. *£25,000. December 30, 1925.

STELLA GILL COKE AND BYE-PRODUCTS CO., LTD., London, E.C. (M., 24/7/26.) Registered July 13, £20,000 debentures, part of £300,000; general charge (except uncalled capital). *£236,900. June 25, 1925.

Satisfactions

HORTON MANUFACTURING CO., LTD., Rickmansworth, liquid soap manufacturers. (M.S., 24/7/26.) Satisfaction registered July 7, £6,100 and £1,000, registered October 26, 1922.

MILLBAY LAUNDRY CLEANING AND DYEING CO., LTD., Plymouth. (M.S., 24/7/26.) Satisfaction registered July 12, £900, registered December 16, 1910.

Receivership

KEY PRODUCTS, LTD. (R., 24/7/26.) G. W. Roberts, incorporated accountant, of 31–4, Basinghall Street, E.C., was appointed receiver and manager on July 7, 1926, under powers contained in 1st mortgage debenture dated February 1, 1924.

London Gazette, &c.

Companies Winding Up Voluntarily

COLLOISIL COLOUR CO., LTD. (C.W.U.V., 24/7/26.) Mr. William Patrick Masterson, Bank of England Chambers, Tib Lane, Manchester, chartered accountant, appointed liquidator July 13. Meeting of creditors at the offices of Handley, Wilde and Charlton, Bank of England Chambers, Tib Lane, Manchester, on Thursday, July 29, at 12 noon. Creditors' claims by August 31,

GRISCO, LTD. (C.W.U.V., 24/7/26.) J. Sullivan, St. Albans Mews (opposite Earl Street), Paddington, London, W.2, appointed liquidator, March 11.

HONEYMAN (G. W.) AND CO., LTD. (C.W.U.V., 24/7/26.) By special resolution, May 31, confirmed June 29. J. W. Armstrong, incorporated accountant, 2, Collingwood Street, Newcastle-upon-Tyne, appointed liquidator.

Partnerships Dissolved

ACME SOAP AND CHEMICAL CO. (Robert Page ADCOCK and John Poole RIVERS), soap and disinfectant manufacturers and general merchants, 41, Oakfield Street, by mutual consent, May 26, 1926, so far as concerns J. P. Rivers, who retires from the firm. Debts received and paid by R. P. Adcock, who will continue the business.

BAXTER HART AND CO. (Edward BURGESS and Baxter Herbert HART), bleachers and dyers, New Bedford Road, Luton, by mutual consent as from June 30, 1926. Debts received and paid by B. H. Hart.

Latest Government Contracts

RECENT Government contracts placed by the various departments include:

Admiralty

CIVIL ENGINEER-IN-CHIEF'S DEPARTMENT, PORTSMOUTH.—Steel castings: Carntyne Steel Castings Co., Renfrew, Scotland.

War Office

Aluminium Alloy Bars: The Stirling Metals, Ltd., Coventry. Charcoal, Activated: Sutcliffe, Speakman and Co., Ltd. Paint: Rowe Bros. and Co., Ltd., Bootle, Liverpool.

Air Ministry

Acetylene Gas: British Mannesmann Tube Co., Ltd., Swansea. Dope, Cellulose, Acetate: British Celanese, Ltd., London. Dope Covering Nitro: Cellon (Richmond), Ltd., Richmond, Surrey; Nobel Chemical Finishes, Ltd., Stowmarket. Extinguishers, Fire, Froth: Foamite Firefoam, Ltd., London. Extinguishers, Fire, Refills for: General Fire Appliance Co., London. Gas, Acetylene: Allen Liversidge, Ltd., London. Methyl Ethyl Ketone: Chance and Hunt, Ltd., London. Oxygen Gas: British Oxygen Co., Ltd., London. Stannic Chloride: Wm. Blythe and Co., Ltd., Church, Lancs.

Crown Agents for the Colonies

Acetylene Gas Station: The Gas Accumulator Co. (United Kingdom, Ltd.), Brentford. Cement: Cement Marketing Co., Ltd., London; T. Beynon and Co., Ltd., London. Candles: Price's Patent Candle Co., London. Ice and Refrigerating Plant: Seagers, Ltd., Dartford, Kent. Lux Cells: The Chloride Electrical Storage Co., Ltd., London. Muntz Metal, etc.: Allen Everitt and Sons, Ltd., Smethwick, near Birmingham. Novarsenobillon: May and Baker, Ltd., London. Plant: Bellis and Morcom, Ltd., Birmingham.

German Steel Trust

IN the last Monthly Metallurgical Supplement of THE CHEMICAL AGE reference was made to the formation of a steel trust in Germany. Loans of 90,000,000 Reichsmarks in Germany and of $30,000,000 in the United States have been raised by the trust for various purposes. The trust is known as the Vereinigte Stahl Werke A.-G., Dusseldorf (United Steelworks). The total capital is 800 million Reichsmarks, and further 125 million bonus shares have been issued. According to the American prospectus, the total value of the plant owned is above $537,000,000. The trust owns 122 million square metres of land, 151 coal-mining properties with reserves of about 5,000 million tons, 63 blast furnaces (with a capacity of 9,000,000 tons of raw iron per year), 32 Thomas and Bessemer furnaces and 116 Siemens-Martin furnaces (with an annual capacity of nearly 8 million tons). The rolling mills can turn out 7 million tons of finished goods per year. The coal production in 1924 amounted to over 24 million tons, and the participation of the trust in the Rhenish Westphalian Coal Syndicate is over 34 million tons, or 21·6 per cent. The trust has eight ports, a shipyard with an annual capacity of 30,000 tons, and three railway factories turning out about 7,800 trucks per year. About 160,000 workmen and 16,000 clerical workers are employed.